

ON THE SATURNOIDEAN FAMILIES OXYTENIDAE AND
CERCOPHANIDAE

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(With Plates VI-XXI.)

IN this second instalment of our monograph of the *Saturnioideae* (cf. Nov. Zool. xxix. p. 249, 1922) we deal with a few American genera which do not conform with the generally accepted type of a Saturnian and which for that reason may be considered aberrant. But their aberrancy consists more in having preserved some ancestral traits in their constitution than in having wandered along lines of development of their own. The six genera in which we place the 37 species belong to two groups which have nothing in common except that they both stand at the outskirts of the great bulk of the Saturnioideans—each in its own place. It is of no importance for the present whether we consider these groups as constituting two tribes, subfamilies or families. We will call them families in order to emphasize that they fit neither in the *Ceratocampidae* nor the *Saturniidae*. Further investigations may possibly reduce them to a lower rank in the systematics of the *Saturnioideae*.

FAMILY : OXYTENIDAE fam. nov.

The species of this group belong to genera of which the position in classification has hitherto been doubtful. Guenée, Herrich-Schäffer, and the Felders recognised their affinity with the Saturnians, but other authors remained very uncertain about the place which should be assigned to these moths.

We have explained in Nov. Zool. xxx. p. 166 (1923) that the *Saturnioideae* differ from all the allied families in the total absence of a frenulum (not only of its bristles, but also of its base in the wing-membrane), and said that "*Oxytenis*, *Asthenidia*, and some other genera" agreed herein with the *Saturnioideae* and not with the *Eupterotidae* and *Bombycidae*, the only families with which these moths might possibly be placed. We therefore classify them with the *Saturnioideae*, reducing the genera to three.

The family differs from all the other *Saturnioideae* particularly in the proboscis being fairly strong and bearing large carinate papillae, in the antenna being bipectinate in both sexes, with the branches arising on the ventral side (Pl. xii. fig. 11), and the shaft being scaled to the tip, in the spurs of the mid- and hindtibiae (Pl. xii. fig. 10) being scaled to the apex and not having a strongly chitinised claw-like tip, and in the hindwing having a well-developed precostal vein. Labrum transverse, more or less convex, but not projecting as a cone or ridge; a deep groove (hole) at each side of it. Proboscis quite distinct and rolled in; its carinate papillae recall the seeds of Umbellifers. Pilifer placed lower than the dorsal surface of the base of the proboscis and clothed with scales only. Palpus long, the tip approaching the base of the antenna, segment I short, II long, III short, porrect. Shaft of antenna without stiff sensory cone or cones ventrally at the apex, with the exception of the last three segments in *Homoeo-*

pteryx; in *Oxytenis* the ventral apical cone of the *Agliinae* replaced by a soft forked appendage; cilia of branches directed downward. Thorax woolly. Epiphysis of foretibia long in both sexes, reaching to, or to near, apex of tibia; tarsi without spines, with the exception of the fourth foretarsal segment of the ♀, which has an apical spine on each side; hindtibia with one or two pairs of spurs, usually two, the inner apical spur at least two-thirds the length of the first tarsal segment. Suture separating the parasternum from the episternum of the mesosternite (cf. Nov. Zool. 1922, p. 252) oblique.

Neuration (Pl. xiii. figs. 1, 2, 3): In forewing 4 subcostals, SC¹ from cell or beyond, SC² absent, SC³ a short spur off SC⁴; R¹ from upper angle of cell or from stalk of subcostals; SM³ anastomosing with SM², its apex being free. In hindwing the precostal a well-developed tubular vein; C and SC separate from near base, but sometimes almost parallel with one another for some distance; cross-vein D³ obsolescent or obsolete, as in forewing; SM² present.

Early stages very distinctive, known of only a few species:

Larvae (Pl. xiii. figs. 4, 5) of a more or less oily, repulsive appearance, resting on the upperside of a leaf with the anterior third turned side- and backwards, and resembling birds' droppings. Earlier instars with six rows of small tubercles bearing minute bristles, the tubercles smaller and fewer in the last stage; meta-thorax enlarged laterally, bearing dorsally on each side an eye-spot; on preanal segment an S-shaped horn with bifid tip.

Food-plants: *Rubiaceae*.

Pupa not in a cocoon, but concealed in a dry leaf of which the margins are more or less drawn together by silken threads. Sheaths of appendages of head and thorax recalling the pupae of *Arsenura*, but only one leg is showing, the foreleg, which is much smaller than the sheath of the proboscis; antenna longer than proboscis (Pl. xiii. fig. 6).

The family is purely tropical American, being distributed from Honduras to South Bolivia, Matto Grosso, and South-East Brazil; not known from Paraguay and Northern Argentina.

Three genera:

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| 1. SC ¹ of forewing far beyond cell off SC ⁴ | | 2 |
| SC ¹ of forewing from cell, SC ² and R ¹ of hindwing stalked | 3. | <i>Homoeopteryx</i> |
| 2. Hindwing tailed in both sexes, the tail at R ³ | | 1. <i>Asthenidia</i> |
| Hindwing not tailed, or the short tail at R ¹ | | 2. <i>Oxytenis</i> |

1. Genus: *Asthenidia* Westw. (1879).

Phalaena Geometra L., Cramer, *Pap. Exot.* iii. p. 144 (1780).

Phalaena Attacus L., Stoll, *ibid.* Index, p. 175 (1780).

Therinia Hübner, *Verz. bek. Schmett.* p. 290 (1825) (partim); Möschl., *Verh. zool.-bot. Ges. Wien*, p. 682 (1877); Kirby, *Cat. Lep. Het.* p. 715 (1892) (type: *lactucina*).

Phalaena L., Guérin, *Icon. R. Anim.*, Ins. p. 523 (1829-44).

Asthenia Westwood (nec Hübn., 1826), in Jardine, *Nat. Libr.* xxxvii. p. 209 (1841) (type: *podaliriaria*); Guen., *Uran. & Phal.* i. p. 28, ii. p. 23 (1858) (*Asthenia* not a Geometrid, but a Saturnid).

Thrinia (!) Hübn., Herrich-Schäff., *Schmett. Eur.* vi. p. 89 (1856) (belongs to the Saturnians).

Asthenidia Westwood, *Trans. Zool. Soc. Lond.* x. p. 515 (1879) (nom. nov. pro *Asthenia* praeoec.).

Genotypus, *podaliriaria* Westw. (1841).

Hübner defined his genus *Therinia* as follows: "Flügel nur mit anderthalb dunklen Strichen bezeichnet; blassfärbig im Grunde." He placed under this

diagnosis three species: *T. lactucinaria* (= *lactucina*), *T. strigaria*, and *T. sambucaria*, of which the second and third agree with the description, whereas the first does not. Under the first a synonym is put with a question mark; the insect to which this synonym refers agrees with the diagnosis of the genus (= *Coitus* of Hübner) and is quite different from *lactucina* = *lactucinaria* even as to the family.

Guenée, l.c., clearly stated that *Therinia* was synonymous with *Ouraapteryx*, a Geometrid genus, of which the third species under Hübner's *Therinia* is the genotype. This action of Guenée's equals a selection of that third species *sambucaria* as genotype of *Therinia*.

Thirty-five years later Kirby, l.c., disregarding Hübner's diagnosis of the genus and Guenée's explicit statement of the status of *Therinia*, arbitrarily selected *lactucina* as type of *Therinia*, i.e. just that one species which does not agree with Hübner's description. Moreover, he placed without question mark as synonymous under *lactucina* the entirely different *sambucaria* Clerk nec L., a Uraniid.

The *lactucina* of Kirby's Catalogue, therefore, consists of two species belonging to two families, and the selection of this mixture as genotype is not admissible. However, Kirby's action was *ultra vires* anyhow, as Guenée had definitely settled the question of *Therinia* as above. *Therinia* being a synonym of *Ouraapteryx* and, therefore, not available for the Saturnioideans we are dealing with, and *Asthenia* being preoccupied, the correct generic name is *Asthenidia* Westw. (1879), with the Brazilian *podaliriaria* as genotype.

♂♀. Third segment of palpus short, concealed in the vestiture. Proboscis rather weak, with large papillae as in *Oxytenis*. Antenna bipectinate to apex in both sexes, the branches shorter in ♀ than in ♂; segments of shaft without sensory cone ventrally at apex, but the branches with such a cone at the tip, at least the distal ones; the branches basal and ventral, curved down, shaft scaled to apex, upperside of branches with numerous bristles, which are very thin. Foretibia with large epiphysis; mid- and hindtibial spurs cylindrical, scaled to tip, usually two pairs on hindtibia, the proximal pair sometimes obsolete, the longer apical spur reaching to two-thirds of first tarsal segment or beyond; foretarsus longer than foretibia, hindtarsus shorter than hindtibia, no spines on tarsi excepting the spine at each side of apex of fourth foretarsal segment of ♀, scales of ventral surface of tarsi pointed, lanceolate or spiniform, fifth foretarsal segment of ♀ without scales beneath, densely ciliated instead. Pulvillus large.

Wings alike in the sexes, except that those of the ♀ are a little broader than in the ♂.

No discocellular tuft of raised scales (hindwing often with a minute black dot at lower cell-angle, but the scales composing it not erect); hindwing tailed at R³.

Neuration (Pl. xiii. fig. 1): Cell of forewing very short (antenna reaching beyond apex of cell), SC¹ and SC³ off SC⁴ as very short spurs towards apex of wing, tip of SC⁴ bent down, ending in termen; R¹ off stalk of subcostals, R² curved at extreme base, cross-vein D³ as in hindwing very thin or obsolete. In hindwing precostal present, SM³ distinct, short.

Colour white or buff, with a few bands or lines across the wings, and usually with marginal spots immediately in front of and behind the tail.

Wing-scales nearly all bidentate, with the exception of the fringes; in *A. buckleyi*, however, the two teeth less thin and rather shorter, with a third, central, tooth or an indication of one in the majority of the broader kind of scales.

♂. Scent-tuft at base of abdomen conspicuous, generally well protruding, or at least easily recognized in the scaling, the tuft of hairs being long. Genitalia most varied in the different species. The clasper proper composed of two different sclerites: a strongly chitinised main sclerite which is produced into two processes, P² ventral, always long, pointed, often hooked, and P¹, apical, variable in size, sometimes vestigial; on the outer side of these processes a small soft scaled flap, easily overlooked and sometimes absent, corresponding to the dorsal portion of a normal clasper. Manubrium (= saccus) of segment IX, of which the claspers (= valves) are the pleurites, short, broad, rounded. Penis-sheath varying from being slender, with the apex pointed, to being stout, with the apex dilated and variously armed with processes.

♀. The genital armature much less strongly diversified than in the ♂♂, but different in the various species (8 examined); cavity large, the swellings and folds not very prominent as a rule, one species with a long flat median process; aperture in the middle line, usually proximal, in some species more central.

Larva (Pl. xiii. figs. 4, 13, 14): Metathorax enlarged, but not widened into a large lateral flap as in *Oxytenis*, on upperside a kind of ocellus on each side, the two eye-spots connected by a bar. Tubercles of pronotum small, on meta-notum a small dorsal double tubercle, a slight protuberance on third abdominal segment, no distinct tubercles on the other segments; tubercles more distinct and more numerous in earlier instars. Sits at rest with a half-turn on the upper side of a leaf.—Food-plant: *Rubiaceae*.

Pupa glossy, antennae reaching to apex of wings (with the exception of *A. buckleyi*?).

Hab. Nicaragua to Bolivia and S.E. Brazil.

Only one species is known from Central America and two from S.E. Brazil, whereas in the Guianas and in Amazonia four or five, if not more, may be met with in the same district. The species seem to occur at lower elevations only.

Asthenia (?) *flavicapilla* Mabille (1879), from Madagascar, is possibly an *Anaphe* according to the description, certainly not an *Asthenidia*.

In the outline of the wings and the colour and markings most of the species of *Asthenidia* bear a remarkably intimate resemblance to a tribe of Old World *Uraniidae* (*Strophidia*, *Micronia*, etc.), and to some white *Geometridae*, such as the Palaearctic *Ouraapteryx sambucaria*. Such close similarity between non-related groups of species inhabiting widely separate regions being rare, the present striking instance deserves to be emphasized.

The white species resembling *Ouraapteryx sambucaria* in the straight bands which cross the wings are further interesting on account of the great diversity in the genital armature of species which are almost identical in externals, as well as for the strong geographical variation which obtains in these organs in some of the species.

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| A. Forewing with large black apical patch | Species 1. |
| B. No black apical area. Proximal band of hindwing parallel (or nearly) with the abdominal margin | Species 2 to 10. |
| C. No black apical patch. Proximal band or line of hindwing transverse, almost parallel with termen | Species 11 and 12. |

1. *Asthenidia podaliriaria* Westw. (1841) (Pl. vi. fig. 8. ♂).

Asthenidia podaliriaria Westwood, per Duncan in Jardine, *Nat. Libr.* xxxvii, *Exot. Moths*, p. 209. tab. 19. fig. 1. ♂ (1841) (Rio de Janeiro); Walk., *Lep. Het. B.M.* xxxii. p. 379 (1865) (Brazil).

Asthenidia podaliriaria Westwood, *Trans. Zool. Soc. Lond.* x. p. 515. tab. 86. fig. 10 (neur.) (1879); Jord., *Nov. Zool.* xxx. tab. 3. fig. 11 (1923) (neurat.).

Therinia podaliriaria Westw., Kirby, *Cat. Lep. Het.* p. 715. no. 7 (1892); *id.*, in Allen's *Nat. Libr., Moths*, iv. p. 63. tab. iii. fig. 1 (1897).

Female not known to us, not described, probably similar to the ♂. Early stages not known.

♂. White. Antenna drab brown. Wings with three narrow drab brown bands, the outer one of them submarginal, on forewing a thin discocellular bar, apex of forewing brownish black above and below. On hindwing the fringe brownish black from costal angle to tail; the black spot in front of tail with an orange spot at the outer margin. No submarginal line on underside.

Proximal pair of spurs of hindtibia much reduced, usually vestigial only, concealed in the scaling of the tibia. In forewing the cell closed, the discocellular D^3 being distinct though very thin, M^1 stalked with R^3 , not arising from cell. In hindwing the cell open; SC^2 stalked with R^1 .

♂. Eighth abdominal segment without distinction, the species therein differing much from the other species; the apical margin of the eighth sternite medianly slightly convex (Pl. ix. fig. 1, VIII. st.), feebly chitinised. Tenth tergite (X. t.) very broad, without median process, but the lateral apical angles produced as a blunt cone (Pl. ix. fig. 2). Tenth sternite (X. st.) raised into a prominent transverse ridge which projects laterad and is armed with teeth at the apex of this lateral projection. Anal cone very large (An), strongly chitinised ventrally and laterally, sharply defined. The clasper composed of two processes, P^1 finger-shaped in ventral aspect, but pointed if viewed from the side (Pl. ix. fig. 3); process P^2 broad from base to beyond middle, here abruptly narrowed and sinuate, the apex compressed, twisted, sharply pointed, and curved upward; flap Cl absent. Penis-sheath (Pen) thin, with small apical hook.

Length of forewing: ♂, 24 to 28 mm.

Hab. S.E. Brazil: Rio de Janeiro, probably more widely distributed.

In the Tring Museum a small series. Also in Mus. Brit. and Mus. Joicey.

2. *Asthenidia amphira* Druce (1890) (Pl. vi. fig. 10. ♂).

Asthenidia amphira Druce, *Proc. Zool. Soc. Lond.* p. 508 (1890) (Intaj, Ecuador).

Therinia amphira Druce, Kirby, *Cat. Lep. Het.* p. 715. no. 3 (1892).

♂♀. The second largest species known, *A. buckleyi* being the largest. As in *A. geometraria* the forewing with a discocellular bar, two discal bands, convergent posteriorly, and a subterminal band, all of a leaden grey colour, without the cinnamon tint which the bands of the allied species have; outer discal band not broken at M^2 . Outer band of hindwing broader than in *A. geometraria*, not wavy in the region of the tail; subterminal leaden band of hindwing abbreviated in front of tail, not extending forward to costal angle; tail comparatively long, traversed by a black line (= R^3); fringe from tail to costal angle blackish at base and whitish grey distally.

Blackish scaling on head and legs much reduced. Hindtibia with two pairs of spurs. M^1 of forewing from near angle of cell or from R^3 ; cell closed in

both wings, but the cross-vein D^3 very thin; SC^2 of hindwing stalked with R^1 ; R^3 ending just below tip of tail, in all the other species at the hindmargin of the tail.

♂. Eighth abdominal sternite (VIII. st., Pl. ix. fig. 4) deeply incurved, not lobate or convex in middle of apical margin. Anal tergite (X. t.) with a median process, which is rather long, slightly spathulate, obtuse (Pl. ix. fig. 5), and with an irregularly triangular, large, acuminate lateral process. Anal cone soft, and therefore quite irregular in shape in dry specimens. Tenth sternite without ridge or lobes. Outer lobe Cl of clasper distinct (Pl. ix. fig. 4); the two inner processes P^1 and P^2 long, P^2 pointed, P^1 obtuse. Penis-sheath (Pen) with a long collar projecting from a penis-funnel (P-F) which is larger than usual; penis-sheath itself (Pl. ix. fig. 6) large, apically divided into two long processes, of which the shorter one is broad, elongate-triangular, the longer one very slender and more than twice the length of the former.

♀. The walls of the genital cavity not strongly chitinised (Pl. xi. fig. 8); aperture (*o*) proximal, surrounded by irregularly concentric folds, the lateral fold bounding this plicate area extends backwards at each side of middle as a distinct though small ridge, these two ridges slightly diverging posteriorly and disappearing on the smooth, glossy apical area of the sclerite.

Early stages unknown.

Length of forewing: ♂♀, 33 to 40 mm.

Hab. Colombia, Ecuador, Peru, and Bolivia. Evidently confined to moderately high altitudes of the Andes.

In the Tring Museum a series of ♂♂ and one ♀ from: Popayan, Colombia (Lehmann).—Coca, Upper R. Napo, Ecuador, v.-vii. 1899 (W. Goodfellow); Zamora, S.E. Ecuador, 900 to 1,200 m. (O. T. Baron).—Chanchamayo, E. Peru (Schunke); Pozuzo, Huanuco (W. Hoffmanns); Huancabamba, Junin, 1,500 m. (E. Boettger); La Union, La Pampa, and St. Domingo, Carabaya, S.E. Peru, June, July, November, and December, at altitudes from 600 to 1,800 m. (G. R. Ockenden).—Chulumani, Bolivia, 2,000 m., December (Simons), and Yungas de la Paz, Bolivia, November 1899, 1,000 m. (O. Garlepp).

In Mus. Joicey likewise a good series.

In Mus. Brit. three ♂♂ from El Porvenir and Huancabamba, Peru.

3. *Asthenidia transversaria* Druce (1887) (Pl. vi. fig. 2. ♂).

♂. *Asthenidia transversaria* Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 226. tab. 24. fig. 1 (1887) (Nicaragua, Costa Rica, Panama, Colombia).

Therinia transversaria Druce, Kirby, *Cat. Lep. Het.* p. 715. no. 1 (1892).

♂♀. In colour and markings similar to *A. amphira*, on an average smaller, more chalky white, the bands more cinnamon (i.e. with a yellowish tone), tail shorter and without black line. Spot before tail for the greater part yellow, black spot behind tail large, larger than in the allied species; subterminal drab band of hindwing continued forward as a thin line some distance beyond the antecaudal spot, postmedian band of hindwing broadened in caudal area, marginal line from tail forward much deeper black than in *A. amphira*.

Distinguished from *A. geometraria* by the second discal band of the forewing not being broken at M^2 , the postmedian band of the hindwing being wider and not distinctly dentate in caudal region, by the large antecaudal yellow spot and the

large postcaudal spot, further by the much abbreviated and much thinner sub-terminal line of the hindwing, the presence of two pairs of spurs on the hindtibia, the more restricted black colouring on the head and legs, and by the widely different genitalia.

Cell closed in both wings, cross-vein D^3 complete though thin; in forewing M^1 from cell-angle or on a short stalk with R^3 ; in hindwing SC^2 and R^1 from a point or separate, not distinctly stalked.

♂. Eighth sternite characteristically modified (Pl. ix. fig. 7, VIII. st.): distally strongly chitinised, depressed, with the apex enlarged anad and the apical margin curved ventrad, a well-defined, rounded glossy lobe being formed which is broader than long. Tenth tergite (Pl. ix. figs. 7-11) divided into two dorso-lateral processes, which are acuminate, in lateral aspect elongate-triangular; at the base of each process, dorsally, there is a rounded hump, geographically variable in size. Tenth sternite without lobe or ridge. Anal cone transverse. Clasper (Pl. ix. figs. 15-18) with two processes, the exterior flap Cl absent; lower process P^2 much the longer, pointed, the tip curved dorsad; the upper process P^1 geographically variable. Penis-sheath (Pl. ix. figs. 12-14) likewise different according to locality, always large, ending with three processes, of which the middle one is broad, triangular, and bears the large aperture.

♀. We have of this sex only one, rather dilapidated, specimen without locality from the Felder collection. Our figure (Pl. xi. fig. 9) of the genital sclerite requires confirmation. Seventh sternite internally strongly chitinised and convex, forming the roof of a large genital cavity. In front of the vaginal aperture (o) a transverse ridge; behind the aperture two nearly parallel, longitudinal ridges as continuations of the lateral edges of the aperture, the space between this pair of ridges very little concave and almost on a level with the ridges; at each side of this narrow raised median triangle a rather deep longitudinal ditch, laterally of which the sclerite is rounded-convex.

Length of forewing: 22 to 34 mm.

Early stages not known.

Hab. Nicaragua to Colombia, in several geographical forms, which differ in the genital armature of the ♂♂ (only one ♀ has been examined).

(a) *A. transversaria salax* subsp. nov. (Pl. vi. fig. 2, ♂).

A. t. Druce, *l.c.* (partim).

♂. Dorsal humps of anal tergite (Pl. ix. figs. 7-9) low; upper process P^1 of clasper (Pl. ix. figs. 15, 16) not divided or only with indications of projections; penis-sheath (Pl. ix. fig. 12) with the upper process (on the backside of the aperture) very large, slightly resembling a cricket-bat, but with the offside and apex rounded and the apex denticulate, the second process bearing the aperture much shorter than the third, which is slender and has a few teeth at apex and lower margin.

Hab. Nicaragua; Costa Rica.

In the Tring Museum three ♂♂ from: Rio Wanks, Nicaragua, ix. 1905 (M. G. Palmer); Carreblanco, Costa Rica, type (Lankester), and Costa Rica, ix. 1919.

In Mus. Brit. four ♂♂, one ♀ (without abdomen) from: Chontales, Nicaragua; Cache, Costa Rica; and Costa Rica.

(b) *A. transversaria transversaria* Druce (1887).*Asthenidia transversaria* Druce, l.c. (1887).

♂. Upper process P¹ of clasper shorter than in the previous race, with short apical projections (Pl. ix. fig. 17); longest process of penis-sheath (Pl. ix. fig. 13) much narrower than in *A. t. salax*, and the third process quite short.

Hab. Panama; West Colombia?

In Mus. Tring one ♂ from Chiriqui.

In Mus. Joicey some ♂♂ from Bugaba and Chiriqui; "type" from Chiriqui ex coll. Druce.

In Mus. Brit. seven ♂♂, two ♀♀ from Chiriqui, 2-3,000 ft., Bugaba, 800-1,500 ft., Panama, and "Colombia." The single Colombian ♂, from an old collection, without precise locality, agrees with the present subspecies, not with the next; it probably came from Western Colombia.

(c) *A. transversaria columbiana* subsp. nov.

(†) *Asthenia geometraria* Feld., Weymer, in Stübel, *Reise Süd-Amer.* p. 25. no. 131 (1890) (Villavicencio, Colombia.—Probably this subsp. not *geometraria*).

♂. Dorsal humps of anal tergite much higher than in the previous races, being modified into prominent processes (Pl. ix. figs. 10, 11); lateral processes of this tergite broader. Upper process of clasper (Pl. ix. fig. 18) short, divided into two curved prongs, of which the upper one is united with a third projection, simple or forked, placed on the inner side. Penis-sheath (Pl. ix. fig. 14) nearly as in *A. t. transversaria*, but the upper process comparatively shorter and without teeth at the apex, lower process hooked.

Hab. Colombia.

In Mus. Tring from: Muzo, R. Cantinero, 400 m. (A. H. Fassl), 1 ♂ (type); Bogotá, 1 ♂; and 1 ♀ ex coll. Felder, presumably received from Lindig, Bogotá.

4. *Asthenidia terminalis* spec. nov. (Pl. vi. fig. 3, ♂).

♂. Colour and pattern as in *A. transversaria*, but forewing with a thin black line at the terminal margin itself, the fringe remaining white, the line interrupted at the veins and more or less indistinct towards hind angle. Hindwing as in *A. transversaria*, but the subterminal band much more distinct from the tail forward than in the forms of *transversaria*, postcaudal spot larger than antecaudal one, the yellow portion of the latter smaller than in *transversaria* and of a more ferruginous tint; on tail a brown vein-streak as in *A. amphira*.

Length of forewing: 33 to 35 mm.

Two pairs of spurs on hindtibia. Cell closed in both wings, but D³ very thin; M¹ of forewing from cell close to angle; SC² and R¹ of hindwing separate or from a point, not stalked.

Eighth sternite (VIII. st., Pl. ix. fig. 19, ♂) most peculiar, bearing a large, somewhat convex, rounded median lobe which is armed at the margin with blunt, tooth-like, projections. Tenth tergite (X. t., Pl. x. fig. 1) likewise distinctive, slightly resembling that of *A. transversaria columbiana*; divided into four obtuse processes of about equal lengths, the processes diverging and recalling the tentacles of a slug. Anal sternite without ridge or lobe. Lower process P² of clasper (Pl. x. fig. 2) long, more or less compressed and slightly twisted, ending

with a short, feebly curved, hook ; process P¹ quite short, connected by means of a ridge with another small process which is placed inward of it and a little further back ; at the base of the claspers, concealed by the eighth sternite, there is a smooth erect median sclerite, almost vertical posteriorly, convex anteriorly and rounded transversely, somewhat resembling a quarter of a globe in a ventral aspect (but its longitudinal diameter too short), and representing the ninth sternite (IX. st., Pl. x. fig. 2, lateral aspect). Penis-sheath large, with two pointed apical processes (Pl. x. figs. 3, 4), the shorter one curved dorsad and sinistro-laterad, the other nearly straight.

♀ and early stages not known.

Hab. Ecuador ; Colombia.

In Mus. Tring from : Paramba, N.W. Ecuador, 3,500 ft., iii. 1897 (W. F. H. Rosenberg), ♂, type, another ♂ from the same place, without name of collector, and a third from R. Dagua, W. Colombia (W. F. H. Rosenberg).

In coll. Paul Dognin 1 ♂ from Ecuador, probably Ambato.

5. *Asthenidia geometraria* Feld. (1862) (Pl. vi. fig. 9).

♀. *Asthenia geometraria* Felder, *Wien. Ent. Mon.* vi. p. 188. no. 177 (1862) (R. Negro) ; iid., *Reise Novara, Lep.* p. 2. tab. 92. fig. 2 (1874).

Therinia geometraria Feld., Kirby, *Cat. Lep. Het.* p. 715, no. 6 (1892).

♂♀. One pair of spurs on hindtibia. White, with the usual blackish brown colouring on frons, palpus, and legs. Bands of wings varying from wood-brown to sepia-brown, three on both wings, the third subterminal, close to margin but separate from it ; on forewing a discocellular bar of the same colour, first band of forewing the broadest, 1 to 1.5 mm. wide, straight, oblique, running from about middle of costal margin to three-fourths of posterior margin, second band commencing at three-fourths of costa, less oblique than the first, broken upon M². First band of hindwing nearly parallel with abdominal margin, second curved in middle and here widened and irregularly zigzag or dentate, fringe black from tail to costal angle, antecaudal black spot with ferruginous outer dot. Underside white, costal margin of forewing cinnamomeous drab, this colouring fading away distally.

♂. Eighth sternite (Pl. x. fig. 7) well chitinised, with a broad, truncate-rotundate, median lobe, which varies in size, is widest apically, and usually has the angles subacuminate (we have drawn the lobe separately, as it conceals too much of the claspers) ; its dorsal surface transversely ribbed. Tenth tergite truncate-rotundate, dorsally hardly at all projecting (Pl. x. figs. 5, 6, X. t.), but far down the sides with a very long and slender process, which is pointed and slightly curved inward, the two processes far apart (Pl. x. fig. 6), and curved like a pair of round brackets, but less strongly so, in a lateral view almost straight, with the tip usually bent down (Pl. x. fig. 5). Anal cone large, long, ventrally rather strongly chitinised. Tenth sternite without ridge or lobes. Clasper with two very long, slender processes, in a ventral aspect these processes together with the penis-sheath and the two processes of the anal tergite look like a bundle of swords ; lower process P² compressed, much broader in a lateral view (Pl. x. fig. 5) than when seen from below, its apex pointed and curved upwards, the base gradually swelling out, its ventral surface convex ; upper process P¹ very slender, shorter than P². All these processes vary to some extent. Penis-sheath (Pen)

large, long, distally compressed, the apex entire and rounded (in a lateral view, Pl. x. fig. 5).

♀. Genital cavity smooth, without prominent ridges; from the orifice side-wards extends a median belt which is more strongly chitinised (Pl. xi. fig. 7).

Larva unknown. Pupa-shell (in coll. A. M. Moss) pale clay-colour.

Length of forewing: ♂♀, 24 to 33 mm.

Hab. The Guianas, Amazonia, Peru, Matto Grosso; probably also Bolivia, Ecuador, and Colombia, but we have not seen specimens from these countries.

In the Tring Museum a series of both sexes from: Surinam, French and British Guiana, Pará, R. Madeira, R. Negro (type, ex coll. Felder), East and South-East Peru (Pozuzo, Chanchamayo, Carabaya), Matto Grosso.

In Mus. Joicey likewise a series.

In us. Brit. eight ♂♂ from Venezuela and British Guiana.

6. *Asthenidia celata* spec. nov. (Pl. vi. fig. 5. ♀).

Asthenidia geometraria Feld., Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 226 (1887) (Ecuador).

♂♀. In colour and pattern almost identical with *A. geometraria*; the bands of both wings rather thinner, particularly the second; this band on the forewing much less distinctly broken at M^2 , sometimes not broken, and on hindwing more regularly scalloped before middle; an indication of a brown marginal line from postcaudal spot towards anal angle. Hindtibia with two pairs of spurs (in *A. geometraria* one pair), and the cell of the hindwing closed, cross-vein D^3 being complete though very thin. Genitalia quite different:

♂. Eighth sternite simple, slightly incurved, without lobe, feebly chitinised (VIII. st., Pl. x. fig. 8). Anal tergite with two long dorsal processes, which point downwards and are compressed, their transverse diameter much shorter than the vertical one (cf. dorsal and lateral views, Pl. x. figs. 9, 11). Anal sternite without armature. Anal cone very large, strongly chitinised dorsally in roof-shape. Clasper with two processes, the lower one, P^2 , broad, compressed, sinuate below tip, with the upper angle projecting. P^1 quite different from that of any other known species: somewhat resembling a slightly bent arm in a ventral aspect, with the fingers replaced by spines. Penis-sheath very slender (Pen), slightly dilated before apex, with the tip acuminate (Pl. x. fig. 10).

♀. Anterior wall of genital cavity rather strongly chitinised, with a well-raised sharp transverse ridge laterally, in front of this ridge a moderately high swelling; from the vaginal aperture backwards two nearly parallel ridges, which are the edges of an elevated median area and are continuous with the posterior margin of the eighth sternite (Pl. xi. fig. 11).

Early stages not known.

Hab. Amazons; Ecuador.

In Mus. Tring from: Fonteboa, Upper Amazons, ix. 1906 (S. M. Klages), one ♂, two ♀♀.

In Mus. Joicey a ♀ from Sarayaco, Ecuador (Buckley).

7. *Asthenidia paulina* spec. nov.

♀. In colour and pattern like *A. geometraria*, the bands of the only known specimen (which is bad condition) thin, the outer discal band of the forewing more strongly broken at M^2 , the anterior end of the short posterior portion being

more distant from the posterior end of the main portion of the band. Hindtibia with two pairs of spurs as in *A. celata*.

External genital armature (Pl. xi. fig. 10) quite different from that of any other known species; the genital sclerite medianly produced into a very prominent, flat process projecting from the cavity and about twice as long as broad; the apex of the process asymmetrically rounded (in this specimen).

Length of forewing: 32 mm.

Hab. S.E. Brazil.

In Mus. Brit. one ♀ from Saõ Paulo, 750 m., ex coll. F. Dukinfield Jones.

8. *Asthenidia diffissa* spec. nov. (Pl. vi. fig. 6. ♂).

♂♀. Another species with the colour and pattern of *A. geometraria*. Second band of forewing not broken at M². Inner band of hindwing forked on M¹ and more or less hooked at the end, nearly as in *A. stricturaria*, second band almost of even width from below costa to caudal region, thence thinner and scalloped or undulated, the veins in the band slightly darker in transmitted light than the band; subterminal band as in *A. geometraria*, continued to near costal angle, thin behind tail, from tail forward slightly broader than the subterminal band of the forewing and placed a little farther away from the fringe than even in *A. geometraria*, much farther away than in *A. terminalis* and *A. transversaria*; antecaudal spot somewhat larger than, or about as large as, the postcaudal one, with a ferruginous marginal dot; fringe and extreme edge of wing black or blackish from tail to costal angle. Hindtibia with two pairs of spurs. Cell closed in both wings, but cross-vein D³ very thin; M¹ of forewing from cell close to angle or from angle; SC³ of hindwing stalked with R¹.

♂. The eighth sternite (Pl. xii. figs. 1, 2, 4-6) differs from that of all the known species in being armed with a very long curved pointed process at each side, the processes reaching to the apex of the anal tergite and varying geographically; in the middle between the bases of these processes a hump or projection; the portion of the segment from this hump to the apical margin membranous. Anal tergite broad, divided into two broad dorsal processes (Pl. xii. figs. 2, 3). Anal sternite with neither ridge nor lobe. Clasper with one long process and a short lateral one which appears to correspond to flap Cl of *A. stricturaria*, the process P¹ missing; P² compressed, pointed, the tip curved upwards (Pl. xii. figs. 1, 4). Penis-sheath slender, ending in a long, narrow, sharply pointed, nearly straight apical process.

♀. Genital armature (Pl. xii. fig. 7) characterised by the aperture of the vagina being placed behind a large, rounded, hump.

Length of forewing: ♂♀, 31 to 38 mm.

Early stages not known.

Hab. Ecuador to South-East Peru, in four subspecies differing in the ♂ genitalia.

(a) *A. diffissa diffissa* subsp. onomatotypica.

♂. Processes of eighth sternite with the apex curved ventrad, median tubercle small; process P² of clasper broad, rather strongly curved (Pl. xii. figs. 1, 2, 3).

Hab. Amazons; Ecuador; Northern Peru.

In Mus. Tring from: Tefé, Upper Amazons, x.1897 (M. de Mathan), 1 ♂.

In Mus. Joicey from : Sarayaco, Ecuador (Buckley), 1 ♀; Rentema Falls, Upper Marañon, N. Peru, 1,000 ft. (A. K. E. Pratt), 1 ♂.

(b) *A. diffissa fortis* subsp. nov.

♂. Processes of eighth sternite longer than in the other races of the species, curved sideways and up, not down, median tubercle small; process P² of clasper nearly as above, but less curved (Pl. xii. fig. 4).

Whether there are differences between the races also in the ♀♀ we do not know, as we have no specimens of this sex of races *a* and *c*.

Hab. Central East Peru.

In Mus. Tring from : La Merced, Chanchamayo (type), 1 pair, "Peru" (probably from the department of Junin or Huanuco), 1 ♂, and 1 ♀ without locality.

(c) *A. diffissa inca* subsp. nov.

♂. Processes of eighth sternite nearly as in *A. d. diffissa*, but more strongly curved, median tubercle very much higher, having developed into a conical process which inclines anad; process P² of clasper narrower than in the two previous subspecies, the apical hook less abrupt (Pl. xii. fig. 5).

Hab. Southern East Peru.

In Mus. Tring from : Cajon, Cuzco, xi. 1890 (Garlepp), 1 ♂.

(d) *A. diffissa tridens* subsp. nov.

♂. Processes of eighth sternite more strongly curved than in *A. d. inca* and somewhat twisted; median tubercle replaced by a long process which reaches well in between the processes P² of the claspers, being about three times as long as in *A. d. inca*; P² as in *A. d. diffissa* (Pl. xii. fig. 6). Postcaudal spot a little larger than antecaudal one.

Hab. South-East Peru.

In coll. Paul Dognin 1 ♂ from R. Yahuar Mayo, Carabaya, 1,200 ft., iv. 1912.

9. *Asthenidia stricturaria* Hübn. (1825).

♂. *Therinia stricturaria* Hübner, *Zutr. Samml. Exot. Schmett.* 3. p. 36. no. 284. figs. 567, 568 (1825) ("Java" error); Kirby, *Cat. Lep. Het.* p. 715. no. 5 (1892) (Pará).

♂. *Phalaena machaonaria* Guérin, *Icon. R. Anim., Ins.* p. 523. tab. 90. fig. 1 (1829-44) (Colombia). *Asthenia machaonaria* Guér., Duncan, in Jardine, *Nat. Libr.* xxxvii. p. 210 (1841); Walk., *Lep. Het. B.M.* xxxii. p. 379 (1865) (Pará).

Asthenia stricturaria (!) Hübn., Walker, *l.c.* xxxv. p. 1919 (1866) (= *machaonaria*).

Thrinia (!) *strigaria* (!) Hübn., Herrich-Schäffer, *Schmett. Eur.* vi. p. 89 (1856).

Therinia machaonaria Guér., Möschler, *Verh. zool.-bot. Ges. Wien*, p. 682 (1877) (Surinam).

♂♀. White, forewing with three bands, the proximal one corresponding to the discocellular bar of the other white species, complete from costal to hind margin, second band parallel to the first, third converging with second posteriorly, commencing at costal margin or below it halfway between second band and apex of wing, no subterminal line, but fringe blackish brown, as it is on hindwing between costal angle and tail. On hindwing three bands, the first a continuation of the proximal band of the forewing, converging with the abdominal margin, which it does not reach, ending at M², where it is curved basad, usually an outward tooth before M¹; second band a mere line, crenulate or zigzag in posterior half and here approximated to the third band, which is parallel to the termen, being

rounded-elbowed in the region of the tail, from anal angle to anterior marginal spot (or a little farther forward) a subterminal band ; black antecaudal spot with a hazel dot on the proximal side, not at the outer margin. Cf. Pl. vi. fig. 7.

On underside often a distinct line corresponding to the submarginal line of species Nos. 11 and 12 ; usually some diffuse brownish subterminal scaling from tail backwards. Cell open in both wings, in forewing cross-vein D^3 present as a small spur off R^3 , the spur continued for some distance as a longitudinal fold in the cell, M^1 from cell ; in hindwing D^3 absent, SC^3 stalked with R^1 . Hindtibia with two pairs of spurs.

♂. Eighth sternite well chitinised, large, extending far up the sides of the body, its upper apical angle a short, but distinct, free, hard lobe, ventral surface convex, the sclerite rather far distant from the bases of the claspers, the sternite forming the roof of a large cavity, margin of sternite deeply incurved, minutely denticulate. Anal tergite with a median process (Pl. xi. fig. 5) which is about twice as long as broad, its upper surface but moderately convex, the apex with a small sinus or entire. Anal sternite (X. st., Pl. xi. fig. 4) with two rather long contiguous lobes, thick, not strongly chitinised, with the apex slightly sinuate. Outer flap Cl of clasper present ; process P^2 large, narrowed from beyond middle, widened again at apex, the apical portion compressed, apex sinuate, with the upper projection pointed and the lower rounded ; upper process P^1 finger-shaped, its outer surface convex, inner surface somewhat concave and pilose ; in front of the claspers a smooth, transverse, semi-erect, and almost semicircular sclerite (IX. st.), part of the ninth sternite. Penis-sheath (Pen) very slender, rather strongly curved twice, with a short, pointed, apical projection.

♀. We have at Tring only one very much battered specimen, the abdomen of which is not well enough preserved for a description of the genital armature.

Length of forewing : ♂♀, 26 to 33 mm.

Early stages not known.

Hab. The Guianas and Amazonia.

In the Tring Museum a series of ♂♂ and 1 bad ♀ : from Surinam, French and British Guiana, Pará, and Teffé. The ♀ mentioned by Felder in *Wien. Ent. Mon.* vi. p. 188 sub no. 177 (1862) is no longer in the Felder collection.

Also in Mus. Joicey and Mus. Brit., both sexes.

10. *Asthenidia spinicauda* spec. nov. (Pl. vi. fig. 7. ♂).

♂. Among our ♂♂ from French Guiana there are seven in which the eighth abdominal tergite has not the simple margin of the preceding species, but bears at each side a marginal projection which is very sharply pointed, the apical portion of the projection being spiniform. I cannot find any other difference from *A. stricturaria*. This may be a case of dimorphism, but such a clear-cut dimorphism in the tail-end would be an exception among Lepidoptera (only *Papilio xuthus* is known to differ slightly in the tail-ends of the seasonal forms) that I prefer for the present to look upon the difference as specific.

Hab. French Guiana ; Amazonia.

In Mus. Tring from : St. Jean and St. Laurent, Maroni R., French Guiana, 7 ♂♂ (received from E. Le Mout), also a ♂ without locality in the Felder collection.

In coll. Paul Dognin 1 ♂ from R. Maués, Amazonas.

11. *Asthenidia lactucina* Cram. (1780) (Pl. vi. fig. 1).

♂♀. *Phalaena Geometra lactucina* Cramer, *Pap. Exot.* iii. p. 144. tab. 273. fig. B, C. ♂ (1780) (Surinam, ♂♀).

Phalaena Attacus lactucina Cram., Stoll, in Cramer, *l.c.* Index, p. 175 (1780).

Therinia lactucinaria Hübner, *Verz. bek. Schmett.* p. 290. no. 2318 (1825) (nec synon.).

Asthenia lactucina Cram., Duncan, in Jardine, *Nat. Libr. xxxii. Exot. Moths*, p. 211 (1841) (Surinam); Walk., *Lep. Het. B.M.* xxxii. p. 379 (1865) (Surinam, Pará); Butl., *Trans. Ent. Soc. Lond.* p. 77. no. 144 (1878) (R. Madeira); Dognin, *Lép. Loja*, ii. p. 40 (1891) (Loja, Ecuador).

Thrinia (!) *lactucinaria* Hübner, Herrich-Schäff., *Schmett. Europ.* vi. p. 89 (1856).

Therinia lactucina Cram., Möschler, *Verh. zool.-bot. Ges. Wien*, p. 682 (1877) (Surinam); Kirby, *Cat. Lep. Het.* p. 715. no. 4 (1892) (nec synon.); id., in Allen's *Nat. Libr., Moths*, iv. p. 63 (1897).

Evidently the commonest species of the genus.

♂♀. Creamy white, often buffish, rarely chalky white without a buff tone. Face brown from the apex of the palpi to beyond the antennae, the dark colour extending around the eyes; palpus except underside, upperside of foretibia except a basal spot and a median one, two spots on midtibia, and tarsal segments I and V dark purplish brown. Upperside of wings with dark cinnamon markings which are more or less shaded with fawn: on forewing a thin discocellular bar, sometimes interrupted, a little before or beyond middle a nearly straight band, usually less than 1 mm. broad, occasionally crenulated, on disc a crenulated or wavy line, in most specimens accompanied on outer side by a diffuse shadowy band, outer half of wing, sometimes the whole wing, irrorated with brown specks. The lines of forewing continued across hindwing, terminal area irrorated, a small discocellular dot, fringe from tail to costal angle blackish brown; in front of tail a largish black spot, chocolate colour in middle, behind tail two smaller spots, the posterior one of them minute, often vestigial, rarely absent.

Underside likewise irrorated with brown on the forewing and in the terminal area of the hindwing; a submarginal line dark brown, nearly parallel to termen of wings, commencing at costal margin of forewing close to apex.

The irroration of the wings distinguishes this species at a glance. Cell open in both wings, D³ being interrupted on forewing, or vestigial in middle, absent or barely indicated on hindwing, M¹ of forewing from before apex of cell, SC² of hindwing stalked with R¹. Hindtibia with two pairs of spurs.

♂. Eighth sternite (Pl. x. fig. 12) resembling that of *A. geometraria*, being produced into a large, individually variable, median lobe which is widest at the apex and truncate or rounded with the angles distinct and the sides incurved; on the dorsal side the lobe not ribbed as in *A. geometraria*. Tenth tergite (X. t.) broad, about as long as it is wide at its junction with the ninth tergite (Pl. x. fig. 13), divided by a narrow triangular sinus into two short, broad, rounded lobes of somewhat variable length. Anal cone small. Tenth sternite (X. st.) raised into a somewhat inflated ridge which is divided into four humps or short processes, the median sinus the deepest one, the two middle humps obtuse and less chitinised than the lateral ones, which are more or less pointed. Lower process P² of clasper broad at base, apically claw-like, upper process P¹ broad, obtuse, at the outside of P² the small flap Cl. Penis-sheath (Pen) quite slender.

♀. Genital sclerite proximally deeply concave, the aperture in this groove; behind the groove on each side two transverse ridges united medianly in arch-shape, the anterior ridge the higher; further frontad at the sides another ridge which becomes visible when the apical portion of the seventh sternite is turned over (Pl. xii. fig. 8).

Length of forewing : ♂♀, 27 to 34 mm.

Larva (Pl. xiii. fig. 4) green, on metanotum a clayish brown transverse bar which terminates at the sides with a small black ocellus, another bar on segment X, tapering laterally, tail and anal segment brown, from tail down a white line which runs along abdomen above the legs. Pupa shell black-brown (bred by A. M. Moss at Pará).—Foodplant: *Oourouparia guianensis*.

Hab. Venezuela, the Guianas, Amazonia, Ecuador southwards to Bolivia, Paraguay, and Matto Grosso.

In the Mus. Tring a series from : La Union and La Vuelta, Caura R., Orinoco, v. vi. 1903, Venezuela (S. M. Klages).—British Guiana; Maroni R. and Kourou R., French Guiana, vii. ix. 1905 (E. Le Mout), also Cayenné; Aroewarwa Creek, Maroewym Valley, Surinam, ii.–iv. 1905 (S. M. Klages), also old specimens from Surinam, among them a ♂ ex coll. Lennep, which does not agree with Cramer's figure.—Pará (A. M. Moss); Humayta, R. Madeira, vii.–ix. 1906 (W. Hoffmanns); Tefé, vi. 1906 (W. Hoffmanns); Pebas, xi. 1906 (M. de Mathan); Fonteboa, v. 1906, viii. 1907 (S. M. Klages).—Zamora, Ecuador (O. T. Baron).—Pozuzo, Huanuco, 800–1,000 m. (W. Hoffmanns); Cuzco, iii. 1901 (Garlepp); Yahuarmayo, S.E. Peru, iii. 1912, 1,200 ft. (Watkins); various places in Carabaya, S.E. Peru, at 3,100 ft. and 3,400 ft., i. iii. iv. viii. ix. xii. (G. R. Ockenden).—Salampioni, 800 m., viii., San Ernesto, 1,000 m., viii. ix., Charaplaya, 1,300 m., i., all in Bolivia (P. O. Simons), Yungas de la Paz, 1,000 m., x., and Yungas de Coroico, 1,800 m. (Garlepp), Buenavista, East Bolivia, vii.–x. (J. Steinbach).—Cuyabá, Matto Grosso (received from Paul Zobrys).

In Mus. Joicey also a series.

In Mus. Brit. 6 ♂♂, 2 ♀♀ from Brit. Guiana, Amazonas, Peru, and Paraguay.

12. *Asthenidia buckleyi* Druce (1890). (Pl. vi. fig. 4. ♀).

♂. *Asthenidia buckleyi* Druce, *Proc. Zool. Soc. Lond.* p. 507 (1890) (Bolivia; E. Peru).

Therinia buckleyi Druce, Kirby, *Cat. Lep. Het.* p. 715. no. 2 (1892).

♂♀. The largest species of the genus. Wings and body pale buff yellow or cream-colour; head black or drab brown, yellow or creamy anteriorly as far as covered by the palpi; upperside of tarsi and of fore- and midtibiae black or dark brown, spotted or irrorated with cream-colour; palpus blackish at side; scaling of hindtibia near spurs the same dark colour irrorated with light scaling.

Wings, on upperside, with two cinnamon bands varying much in width and distinctness, the proximal one postmedian on forewing, nearly straight, almost at right angles to hindmargin, often absent or vestigial, on hindwing this band median and slightly curved, occasionally absent; distal band submarginal, on forewing usually single and often very indistinct, on hindwing usually double and more distinct.

On underside a submarginal line or band on both wings, almost parallel to termen on hindwing and more or less elbowed at R³, sepia brown to cinnamon.

Cell open in both wings, D³ being represented by a longitudinal rudimentary vein or fold which is often very indistinct and curves down distally to join R³ on the forewing and the stalk of M¹–R³ on the hindwing, M¹ of forewing arising from the cell; SC² and R¹ of hindwing stalked together. Two pairs of spurs on hindtibia.

♂. Eighth sternite medianly produced and broadly rounded (VIII. st.,

Pl. xi. fig. 1). Tenth tergite (Pl. xi. fig. 2) long, triangular, apically cleft, the incision quite narrow and the lobes formed about twice as long as they are broad proximally. Anal cone comparatively small. Tenth sternite raised into a broad swollen ridge medianly divided by a narrow sinus, the exposed ventral surface densely granulose. Outer flap Cl of clasper present, small, closely applied to the basal portion of the upper process P¹, this broad, widest in a view from the side, obtuse, its ventral surface flattened in distal half and somewhat concave, lower process P² broad in basal half, abruptly narrowed on the inner side, apical portion first slightly widened and then gradually narrowed to a point and curved. Penis-sheath peculiar, gradually widened distally, then again narrowed, curved, the apical portion bent down, forming a long, pointed, and somewhat twisted process which is directed frontad.

♀. Genital aperture proximal (Pl. xii. fig. 9), in a cavity which is partly roofed over by a long, smooth transverse ridge of the seventh sternite; behind the cavity at each side a large swelling raised into a well-marked hump; at the median side of this hump a circular groove, the edges of which are sharp, the median edge forming a short, oblique, longitudinal carina, the middle line of the sclerite in between the humps impressed.

Larva not known. Pupa shell more glossy than in *A. lactucina*, paler, the minutely denticulate carinulate apical belts of the middle segments of the abdomen narrower (in coll. A. M. Moss, from Pará).

Length of forewing : 37 to 46 mm.

Hab. Colombia, the Guianas, Amazonia, Ecuador, Peru, Bolivia.

Two subspecies, differing in the pattern :

(a) *A. buckleyi buckleyi* Druce (1890) (Pl. vi. fig. 4. ♀).

♂. *Asthenidia buckleyi* Druce, l.c. (Bolivia; E. Peru).

♂♀. Submarginal line on underside thin, at the most 1 mm. wide on forewing, thinner on hindwing and here occasionally vestigial or even absent.

Hab. Colombia southward to Bolivia, the Guianas (presumably also Venezuela), Middle Amazonas (presumably also Upper Amazonas).

In Mus. Tring a series of ♂♂ and three ♀♀ from : Muzo, Colombia, ix.1903 (Mathan); British Guiana; mouth of Kourou R., French Guiana, x.1905 (E. Le Mout); Chanchamayo, E. Peru (A. M. Moss); various places in Carabaya, S.E. Peru, 2,000–3,400 ft., i. viii. ix. xii. (G. R. Ockenden); Bolivia (from Staudinger, coll. by Garlepp); Buenavista, 750 m., viii.–iv., Bellavista, 1,400 m., ix., and Prov. Sara, Depart. de Sta. Cruz de la Sierra, ii.–vi. 1904, Bolivia (J. Steinbach).

In Mus. Joicey from : Mapiiri, Bolivia; Rio Napo, Ecuador; Maroni R., French Guiana.

In Mus. Brit. 2 ♂♂ from Bogotá and Yahuar Mayo, Peru.

(b) *A. buckleyi paraensis* subsp. nov.

♂. Submarginal line of underside about 3 mm. wide in middle on forewing, where it is broadest, 2 mm. or less in middle of hindwing, on both wings very much more conspicuous than in the previous race.

Hab. Lower Amazonas.

In coll. A. Miles Moss 4 ♂♂ from Pará, of which the type and another specimen have very kindly been presented to the Tring Museum.

2. Genus : *Oxytenis* Hübn. (1820).

- Phalaena Attacus* L., Cramer, *Pap. Exot.* i. p. 61 (1775) (partim).
Bombyx, Fabricius, *Ent. Syst.* iii. 1. p. 418 (1793) (partim).
Syssaura Hübner, *Verz. bek. Schmett.* p. 150 (1820) (partim); Herr.-Sch., *Schmett. Eur.* vi. p. 89 (1856); id., *Aussereur. Schmett.* p. 9 (1856).
Oxytenis Hübner, *l.c.* (1820) (partim); Walk., *Lep. Het. B.M.* v. p. 1181 (1855); Kirby, *Cat. Lep. Het.* p. 770 (1892) (*modestia* selected as genotype); Pack., *Monogr. Bomb. Moths*, iii. p. 269 (1914) (partim; descript. & fig. of neurat. evidently taken from some other Saturnian, not an *Oxytenis*).
♂. *Draconipteris* Hübner, *l.c.* (1860) (partim); Walk., *l.c.* p. 1185 (1855); Kirby, *l.c.* p. 764 (1892) (*mirabilis* designated as genotype); Pack., *l.c.* p. 271 (1914).
♂. *Teratopteris* Hübner, *l.c.* p. 151 (1820) (one species, *angulata*); Walk., *l.c.* p. 1184 (1855); Möschl., *Verh. zool.-bot. Ges.* p. 679 (1877) ("belongs to the Saturnians"); Kirby, *l.c.* p. 764 (1892); Pack., *l.c.* (1914).
♂. *Lycabis* Doumet, *Rev. Zool.* (2). xi. p. 263 (1859) (type: *bimaculatus* = ♂ *modestia*); Kirby *l.c.* p. 803 (1892).
Asthenia Westw., Felder, *Wien. Ent. Mon.* vi. p. 189 (1862) ("The species of *Teratopteris*, *Draconipteris*, and *Oxytenis* should be included in *Asthenia*").
♂. *Eusyssaura* Packard, *Journ. N.Y. Ent. Soc.* xi. p. 246 (1903) (type: *honesta* = ♂ *modestia*); id., *Monogr. Bomb. Moths*, iii. p. 269 (1914) (partim).

Though in general aspect, especially in colouring, very different from *Asthenidia*, the present genus closely agrees with it in the structure of the wings and the early stages. The Felders' remark quoted above in the synonymy under *Asthenia* reveals a remarkable insight in the true relationship of these moths.

The name *Syssaura* was proposed by Hübner (1820) for a mixture of five species, of which two are Drepanids (*falcula* = *falcataria* and *sicula* = *curvatula*), two Saturniids (*zebrina* and *honesta*), and one a Geometrid (*drepanula*). Stephens, in 1834, applied the name *Syssaura* Hübn. to the section A of *Drepana*, placing in this section one species, *falcataria*. Most subsequent authors appear to have followed Stephens in associating the name *Syssaura* with the *Drepanidae*. Herrich-Schäffer, however, twenty-two years later, reserved *Syssaura* for the Saturnians, placing in it "*honesta* und viele andere."

We consider Stephens's action quite legitimate; but in order to set at rest any doubt about the application of the name *Syssaura*, we designate *falcataria* = *falcula* Hübn., *Eur. Schmett.* ii. Bomb. fig. 44, as genotype, there being to our knowledge no contrary prior definite selection of a genotype for *Syssaura* Hübn. (1820).

The name next in priority is *Oxytenis* Hübn. (1820). Kirby selected *modestia* as genotype from among the three species included in it by Hübner. This selection is valid.

The later names *Lycabis* and *Eusyssaura* were both proposed for ♂♂ of this same *modestia* (usually misspelt *modesta*).

Draconipteris Hübn. (1820) and *Teratopteris* Hübn. (1820) are based on ♂♂ in which the termen of the wings is sinuate or angulate. Such differences do not justify generic separation, because (1) there are wing-contours intermediate between the extremes, and (2) there is nothing in the ♀♀ to support a division based on the shape of the ♂-wings. We therefore sink both *Draconipteris* and *Teratopteris* as synonyms of *Oxytenis*.

In both sexes of *Oxytenis* the wings have above, and usually also below, a tuft of erect scales at the lower angle of the cell. Termen of wings always entire in ♀; in ♂ it is entire, or dentate, or lobate, and in the hindwing often short-

tailed, the tail being a prolongation of the angle between R^1 and R^2 , not as in *Asthenidia* between R^2 and R^3 ; SC^2 of hindwing from cell.

Proboscis distinct; as in *Asthenidia* with numerous large carinate papillae, the carinae of which usually end with spiniform projections. Antennae not reaching cell-apex; the shaft scaled to apex; branches ventral, curving ventrad from origin, arising at the bases of the segments, one on each side; proximal segments a little broader than long, distal ones longer, sometimes about twice as long as broad, usually but a little longer than broad in a ventral aspect; apices of segments in distal half of antennae more or less elevate ventrally, a small tubercle being formed which projects ventrad-distad and bears a soft, longish, cone, generally split into two or three prongs; no stiff bristles on shaft, but the branches with an apical bristle and one or two dorsal ones, on the distal branches sometimes a few more thin bristles hardly thicker than the ventral cilia; branches shorter in ♀ than in ♂, but even in ♀ at least as long as two segments of the shaft, in the ♀♀ of several species apically dilated and studded on the flattened apical surface with minute cilia (Pl. xiii. figs. 13-19).

Neuration (Pl. xiii. fig. 2) similar to that of *Asthenidia*; cell as short as in that genus, but broader in both wings; in forewing the upper angle of cell obtuse or rectangular, SC^1 from far beyond cell, R^1 from stalk of subcostals, SC^5 nearer to cell than SC^1 , SM^3 anastomosing with SM^2 , M^1 from cell; in hindwing the precostal distinct, SC^2 from cell, not stalked with R^1 , cross-vein D^3 as in forewing very thin, M^1 from cell, SM^3 present, though short and thin.

♂. At base of abdomen of ♂ a lateral scent-tuft of long radiating hairs, usually concealed under the woolly vestiture; we have not observed it in all the species, there being possibly some in which the organ is obliterated. Eighth abdominal sternite (cf. Pl. xiv.-xviii.) rather strongly chitinised, truncate or sinuate, the angles not produced in *O. modestia*, in all the others produced as a lobe or pointed horn. Anal tergite broad, truncate (*O. modestia*) or bilobate; no anal sternite. The clasper consists of a large ventral sclerite (harpe, H) ending with a beak-like process, and of a broader, feebler chitinised dorsal flap (valve, Cl) which is longer than the harpe, concave on the inner side, and more strongly chitinised at the dorsal margin than ventrally. Penis-sheath different in the various species, but always has a rod-like, somewhat tapering, process attached to its base, the sheath bearing a small impression where the rod touches it; this guiding rod projects from the dorsally open lumen of the penis-funnel (P-F), in which it slides like a piston in its cylinder; this structure is confined to *Oxytenis*.

♀. The genital armature on the whole simple, but different in each species of which the true ♀ is known; the genital sclerites do not appear to have a feature in common by which the genus as a whole is distinguished from the allied genera.

The small discocellular tuft of oar-shaped erect or semi-erect scales on the upperside of the wings is a feature peculiar to this genus; it is usually more or less distinct also on the underside; it probably serves to enhance the similarity of the imago at rest to a dry leaf.

Larva (Pl. xiii. figs. 5, 11, 13): early instars resembling birds' droppings, of an oily, offensive aspect, last stage very snake-like; at rest the anterior portion of the body curved sideways and backwards and lying close to the abdomen. Metathorax strongly widened on each side into a sort of broad lobe, above each lobe a luniform ocellus; all segments, at least in the earlier stages, with a trans-

verse row of four tubercles, two on each side; the dorsal tubercles of segment XI forming the bifid tip of the S-shaped tail.

In *O. naemia*, of which my friend the Rev. A. J. Miles Moss, of Pará, has given me a dried larva in the last but one instar, the prothoracic tubercles are the largest (Pl. xiii. fig. 11); in front of the prothoracic stigma a small tubercle, and a similar one on the mesothorax, whereas the corresponding tubercle of the metathorax is larger and placed at the apex of the lateral expansion of the segment; on first abdominal segment a minute tubercle below stigma; all the dorsal and dorso-lateral tubercles, as well as the lateral metathoracic one, bear a peculiar black process, the homologon of a spine, about twice or thrice as long as wide, narrowed at the base, the apex truncate or obliquely acuminate, not sharply pointed, this obtuse spine probably tumid in life; the dorsal and dorso-lateral thoracic tubercles with two such spines, the other tubercles with one. The tubercles, as well as a great portion of the surface of the body, bear small pustules crowned with a very short thin spine which is rounded-enlarged at the tip. Tail fairly long, with a joint in it, movable, the basal portion being a swelling of the eleventh segment, and the apical portion corresponding to the combined two dorsal tubercles of the other abdominal segments; the four tubercles behind the tail pointed and rather larger than the other abdominal ones; anal flap with two tubercles. Opposite the claw of the thoracic tarsi a pair of blackish, strongly chitinised, bifid, flattened spines (Pl. xiii. fig. 13).

Food-plants: *Rubiaceae*.

Pupa coriaceous, somewhat glossy; antenna shorter than in *Asthenidia*, falling far short of the apex of the wing-cases; foreleg broader and longer than in *Asthenidia*, more than half the length of the proboscis; bases of abdominal segments V, VI, VII dorsally as far down as the stigmata, densely carinulate and punctate; cremaster with involute spines (Pl. xiii. fig. 6, 8).

Hab. Honduras to Bolivia, eastward to S.E. Brazil and Pará; 17 species, of 7 the ♂ only being known.

A very interesting feature of the present genus is the strong sexual dimorphism which obtains in nearly every species in the contour and colouring of the wings. It is further worthy of note that quite a number of species are distinguishable with certainty only by the genitalia, which have been compared in very specimen in the Tring Museum as well as in those lent to us.

1. *Oxytenis modestia* Cram. (1780) (Pl. vii. fig. 8. ♂, 12. ♀).

♀. *Phalaena Attacus modestia* Cramer, *Pap. Exot.* iii. p. 143. tab. 272. figs. C.D (1780) (Surinam);
id., *Index*, p. 175 (1780).

Phalaena Attacus modesta (!), id., *l.c.* French text (1780).

♂. *Phalaena Attacus honesta* id., *l.c.* iv. p. 25. tab. 302. figs. C.D (1780) (Surinam).

♂. *Syssaura honesta* Cram., Hübner, *Verz. bek. Schmett.* p. 150. no. 1575 (1820).

♀. *Oxytenis modestia* Cram., id., *l.c.* no. 1578 (1820).

♂. *Oxytenis honesta* Cram., Walker, *Lep. Het. B.M.* v. p. 1182. no. 2 (1855); Druce, *Biol. Centr.-Amer.*, *Lep. Het.* i. p. 198. no. 1 (1886) (Nicaragua, Chiriqui, Ecuador, Peru, Surinam, Pará); Kirby, *Cat. Lep. Het.* p. 170. no. 2 (1892); Druce, *l.c.* ii. p. 427 (1897) (Brit. Honduras; Honduras).

♀. *Oxytenis modesta* (!) Cram., Walker, *l.c.* v. p. 1183. no. 3 (1855); Kirby, *l.c.* no. 3 (1892).

♂. *Lycabis bimaculatus* Doumet, *Rev. Zool.* (2). xi. p. 263 (1859) (Pará); Kirby, *l.c.* p. 803 (1892).

♂. *Oxytenis attaccina* Walker, *l.c.* xxxv. p. 1941 (1865) (Bogotá); Kirby, *l.c.* no. 7 (1892).

♂. *Oxytenis lonomica* Druce, *l.c.* i. p. 198. no. 2. tab. 21. fig. 1 (1886) (Guatemala; Panama).

♂. *Oxytenis lonomia* (!) Druce, Kirby, *l.c.* no. 8 (1892).

♂. *Eusysaura honesta* Cram., Packard, *Journ. Ent. Soc. N.Y.* xi. p. 246 (1903); id., *Monogr. Bomb. Moths*, iii. p. 270. tab. 36. fig. 4 (1914) (Nicaragua to Amazons).

A widely distributed and fairly common species, evidently, being more frequently met with than any other species of the genus. There is a great deal of individual variability, but the species has apparently not split up into geographical forms, though it is found in very different faunistic districts.

♂. This and *O. albilunulata* are the only species of the genus in which the terminal margins of both wings are entire in both sexes. Colouring variable above and below, markings of upperside sometimes absent or obsolescent, with the exception of the line which runs from the apex of the forewing to the middle of the abdominal margin of the hindwing. In most specimens the upperside paler from line to base than from line to termen, on forewing a discocellular patch, two patches on proximal side of line and a third before tornus deeper brown, the last often blackish; on hindwing a row of discal lunules filled in with scaling about as pale as the basal area.—Underside yellow from base to line, outer area brown, but sometimes the whole of the wings brown, in other cases the distal area pale and much shaded with grey; the line of the hindwing irregularly curved distad in middle.

Eighth abdominal sternite (Pl. xiv. figs. 1–4) simple, very little projecting, apical margin truncate, slightly incurved medianly, rounded at the sides. Tenth tergite broad, with a broad, dorsally somewhat convex, median process, which is either truncate-rotundate at the apex or sinuate, the sinus varying in size, but always small, the two lobes of the sinuate tergite rounded or irregularly truncate. Clasper, in lateral aspect, finger-shaped, slightly narrowed and beyond middle curved, the apical portion subtriangular; harpe forked, its ventral process P^2 long, slender, thorn-like, regularly curved dorsad, the upper process P^1 of the fork shorter, directed dorsad, broad, obtuse, its broad side facing the spiniform process somewhat concave. Penis-sheath stout, widest at the orifice, on the left side rounded-widened from before the elongate orifice to beyond it, on this convex part dorsally two teeth, one larger than the other, apical portion from the orifice distad slightly curved towards the right side, flattened, apex sub-acuminate; from the base of the sheath, ventrally, a slender, straight, cylindrical rod, which reaches to the orifice, its tip blunt. Penis-funnel ventrally sinuate.

♀. Colour of upperside nearest to vinaceous cinnamon (Ridgway, *Nomencl. Colours*, iv. 15), shaded with fawn, usually without blackish brown blotches, line as in ♂, but more tawny, outside the line on forewing more or less distinct blackish lunules edged with white on outer side, the row of lunules continued across hindwing, but here indistinct; no black spots on forewing in front of tornus. At apex of distal branches of antenna a dense patch of minute cilia.—Underside variable as in ♂, as a rule yellow from base to line, the outer area usually not much contrasting, being buff or buffish ochreous shaded with purple brown, sometimes the purple brown scaling dense; line of forewing broader than above, replaced on hindwing by an irregular row of purple-brown uniform blotches, the middle lunule more distal than the two before and the two behind it, the yellow area penetrating distad between R^2 and R^3 as in ♂.—Genital cavity of ♀ (Pl. xviii. fig. 1) large, flanked at each side by a broad elevation, the surface of which is concave; farther towards middle a sharply marked narrow ridge which runs frontad and then becomes transverse, bounding the orifice *o* on the frontal side.

Larva: A. M. Moss obtained at Pará a larva which is probably that of the present species. Green, on metanotum two small dorsal eye-spots, one each side,

consisting of a black pupil surrounded by a pale ring which is white anteriorly and yellowish posteriorly; behind middle a large transverse whitish dorsal patch bearing some brown dots in front and behind; tail blackish brown, in front of tail a large diamond-shaped dorsal area purple-brown, anal segment the same colour; above the legs a white line from below tail forward.

Length of forewing: ♂, 27 to 38 mm.; ♀, 33 to 39 mm.

Hab. From Guatemala to Bolivia and South-East Brazil, presumably occurring also in Mexico and Northern Argentina.

In the Tring Museum a series of both sexes, from: Nicaragua: San Ramon, R. Wanks, 375 ft., vii. 1905 (M. G. Palmer), 1 ♀.—Costa Rica: Tuis (W. Schaus), 1 ♂.—Colombia: Purnio, 280 m., x., xi. 1896 (Dr. Bürger), 1 ♂.—Venezuela: San Esteban, vii. 1909 (S. M. Klages), 12 ♂♂, 1 ♀; Palma Sola, 2 ♂♂; Lower Orinoco, x. 1897 (Cherrie), 1 ♂.—Trinidad: Port of Spain (F. Birch), 1 ♂.—British Guiana: Rio Demerera, Christianburg, and without exact locality, 8 ♂♂, 2 ♀♀.—French Guiana: St. Jean and St. Laurent, Maroni R., vii. viii. xii. 1905 (E. Le Mout), 5 ♂♂, 2 ♀♀.—Surinam: Aroewarwa Creek, Maroewym valley, v. 1905 (S. M. Klages), 3 ♂♂; Onoribo, iii. 1893 (C. W. Ellacombe), 1 ♀.—Amazonia: Pará (A. M. Moss), 3 ♂♂ (in coll. Moss also 3 ♂♂); Fonteboa, v. vii. viii. x. 1907 (S. M. Klages), 6 ♂♂; Teffé, ix. x. 1907, and Pebas, x. 1907 (M. de Mathan), 4 ♀♀; in coll. Felder 1 ♂ collected by Bates, without precise locality; Rio Negro, 1 ♂.—Ecuador: Quevedo, West Ecuador (v. Buchwald), 2 ♂♂; Lita, W. Ec., 3,000 ft. (Flemming), 1 ♂; Coca, Upper R. Napo, v.–vii. 1899 (W. Goodfellow), 1 ♂.—Peru: Chanchamayo (Schuncke), 1 ♂; Cajon, Cuzco, xi. 1900 (Garlepp), 1 ♂.—Bolivia: Buenavista, 750 m., viii. 1906–iv. 1907 (J. Steinbach), 1 ♂, 1 ♀.—E. Brazil: Rio de Janeiro, 2 ♂♂; Miritiba, 1 ♂.

The species evidently is very rare in eastern Peru; Ockenden, who sent very large collections from S.E. Peru, never met with it, and the numerous consignments we have received from the Chanchamayo district contained only one ♂. The chief home of the species seems to be Amazonia and the northern countries of South America.

2. *Oxytenis albilunulata* Schaus (1912) (Pl. vii. fig. 13 ♂, 14 ♀).

♂. *Oxytenis albilunulata* Schaus, *Ann. Mag. N.H.* (8). ix. p. 44 (1912) (Costa Rica).

♂. The outline of the wings almost as in the ♀ of *O. angulata*: termen of both wings entire, rounded, apex of forewing produced, anal angle of hindwing not widened inward as a lobe.

Body and wings above varying from ochraceous to chestnut. On forewing from base of M^2 to middle of hindmargin a dark brown curved line, its posterior section darker, in cell a little beyond this line a brown bar, on discocellulars a diffuse brownish bar, accentuated by a dot of raised scales, and on inner side of oblique line, which is yellowish ochraceous or reddish brown on both wings, a broad shadowy deep brown band which curves costad anteriorly, an admarginal line at apex and the fringe from apex to near middle blackish brown, outside the oblique line a thin crenate line edged with white lunules, a row of subterminal, small, dark brown bars, and usually two minute dashes before tornus.—On hindwing an oblique dark-brown line, 8 mm. from base at abdominal margin, not extending forward beyond cell, converging posteriorly with the median line; on

disc a strongly dentate crenate line, black at abdominal margin, effaced from before middle to costa; a row of conspicuous black-brown submarginal dots, the last three nearer the crenate line than the others, no dot below costa; fringe of termen dark brown, with a white line; wool of abdominal margin creamy buff.

Underside bright buff, distally shaded with ochraceous, in costal area of both wings irrorated with dark brown. On forewing a broad line (about 1 mm. wide), broadest in middle, from apex to hindmargin, distinctly curved posteriorly, blackish brown; some minute subterminal spots dark brown.—On hindwing a broad blackish brown line, 2.5 mm. wide in the specimen figured, 1.5 in a second specimen, straight across wing or slightly curved, sometimes lunulate, placed about midway between lower angle of cell and termen; a row of small dark brown subterminal dots, the last two touching the line. Fringe of both wings dark brown.

Genitalia of ♂ (Pl. xiv. figs. 5–11): Eighth sternite drawn out into a very long slender, sharply pointed process on each side. Anal tergite broad, with a narrow median sinus, the lobes much broader than the sinus and also much broader than long. Setiferous submedian ventral swelling of clasper not drawn out into a process; hook of harpe slender, with very sharp point, curved inward and dorsad. Penis-sheath strongly curved ventrad; guiding rod reaching beyond middle of sheath; orifice apical, extending down on the left side; on this side no special armature, while on the right side there is a dentate ridge, visible in a ventral view as well as in a view from the right and dorsal sides.

♀. Upperside darker than in ♂, cinnamon shaded with russet and greyish white; at base of terminal fringe a thin white line (also in ♂), more or less incomplete. On forewing an oblique bar in middle of cell, and from below cell to hindmargin a line curved as in ♂ and reaching hindmargin about at two-fifths, dark brown, a diffuse discocellular bar and nearly halfway to apex a similar bar parallel with the discocellular one pale walnut-brown; from apex of forewing to three-fifths of abdominal margin of hindwing a nearly straight line about 1 mm. broad, walnut brown with a slight tawny tint, beyond this line on forewing a series of thin, but well-marked, white lunules edged with brown on the proximal side and bounding submarginal patches of a clayish buff tint, of which the outer side is bounded by dark-brown bars, the patches R^1-M^2 nearly circular and much larger than the others, patch M^1-M^2 being much the largest.—On hindwing at nearly equal distances between postcellular line and termen first a diffuse blackish zigzag line, anteriorly nearly simple and straight, then a row of dark brown dots, some of which are more or less anguliform; anal angle lobate, but less distinctly than in *O. peregrina*; costal area partly buff as far as covered by forewing.

Underside orange buff, paler towards the base; from apex of forewing a black-brown thick line, fading away near hindmargin, slightly curved, at M^2 7 mm. from fringe and 12 from cell, a row of four minute dark brown subterminal dots.—On hindwing the submarginal line thicker than on forewing, straight, feebly or more distinctly lunulate, at abdominal margin nearer to the fringe than anteriorly, a subterminal row of dark brown dots as above but more distinct, no dot before subcostal vein, last two dots small and contiguous with the line; fringe of both wings blackish tawny.

Antenna similar to that of *O. epiphaea*-♀; from the twentieth bipectinate segment the apices of the branches (Pl. xiii. figs. 15, 16) become gradually enlarged

and bear on the oblique apical surface a large number of small cilia, which are curved and have blunt tips (as in *O. epiphaea*-♀).

Genitalia similar to those of *O. epiphaea*-♀: postvaginal sclerite with two oblique ridges, converging towards the orifice, but remaining far apart; they end abruptly, at some distance above the orifice, in a transverse ridge, which laterally curves frontad flanking the orifice. In front of the orifice a large, smooth, strongly chitinised swelling or tubercle, which corresponds to the lid of the orifice in *O. epiphaea*.

Length of forewing: ♂ 29 mm.; ♀ 35 to 40 mm.

Hab. West Ecuador; Panama.

In Mus. Tring from West Ecuador: Paramba, 2 ♂♂; Bulim, 160 ft., i. 1901 (Flemming and Miketta); Lita, 3,000 ft. (Flemming), 1 ♀.—Panama: Chiriqui, 1 ♀.

3. *Oxytenis mirabilis* Cram. (1780) (Pl. vii. fig. 1. ♂).

♂. *Phalaena Attacus mirabilis* Cramer, *Pap. Exot.* iii. p. 143. tab. 272. fig. B (1780) (Surinam).

♂. *Draconipteris mirabilis* Cram., Hübner, *Verz. bek. Schmett.* p. 150. no. 1580 (1820); Walk., *Lep. Het. B.M.* v. p. 1186. no. 1 (1855) (Demerara); Kirby, *Cat. Lep. Het.* p. 764. no. 1 (1892) ("Niagara to Guiana" ex err.); Pack., *Monogr. Bomb. Moths*, iii. p. 271 (1914) (partim: Demerara; "Peru" alia spec.).

♂. Body and wings, above, clay-colour to tawny-ochraceous; a brown line (often with a pale border on basal side) from costal margin of forewing close to apex to abdominal margin of hindwing, which it reaches at two-fifths. On forewing a small grey spot at upper cell-angle and a black tuft at lower angle, on disc usually some diffuse dark brown clouds, sometimes the greater part of the wing shaded with dark brown; termen lobate in middle, at R³, and denticulate at the other veins; parallel with the oblique line and placed close to it on the distal side a very thin blackish line outlined in white on the outer side, in the last loop of this line three blackish dots.—Hindwing more or less shaded with white on disc, this shading usually concentrated in diffuse blotches, central area often with pink flush, in middle a thin brown line incurved from costal margin to R³ and then three times deeply angulate, a variable number of small blackish brown submarginal spots; termen entire; anal angle not enlarged as a lobe.

Underside warmer brown than upper, much irrorated with blackish brown, base paler. On forewing a black-brown submarginal line more or less bordered with white on the outer side, termen dark brown.—Hindwing with a nearly straight row of blackish brown spots, which are diffuse, luniform or anguliform, and more or less shaded with white, the costal spot conspicuously white, the row about halfway between cell and termen in centre of wing, terminal area shaded with white posteriorly.

Genitalia (Pl. xiv. fig. 12; Pl. xv. figs. 1, 4, 9–11): Lobes of eighth sternite broader than long, truncate, not acuminate, the angles rounded off and the apex somewhat curved inward (dorsad); sinus round. Tenth tergite divided into two lobes, which are longer than broad, with nearly parallel sides and with the apex rounded. Clasper (Cl) broad, concave on the inner side; process of harpe (H) glossy, tapering, curved dorsad, the base of this process swollen, setose, with a small setose expansion on the dorsal side (left in figure). Apex of penis-sheath in a left-side view with an oblique row of teeth which give this portion of the

sheath sometimes the aspect of a flat helmet (fig. 10, taken from one of our two British Guiana specimens; in our other specimen from that country the apex is as in fig. 9). Seen from the right side the opening of the sheath appears as a curved slit partly covered by a flap L; on the apical side of the slip a tooth D, the last of the left-side row; on the dorsal side the sheath is cariniform, sharp, not rounded or convex.

♀ and early stages not known.

Hab. The Guianas.

In Mus. Tring from: Cayenne, 4 ♂♂ (2 ex coll. Felder); St. Jean de Maroni, 1 ♂ (figured) and St. Laurent de Maroni (E. Le Moutl), 1 ♂; British Guiana, 2 ♂♂.

In Mus. Brit. from: British Guiana, 1 ♂.

4. *Oxytenis sobrina* spec. nov.

♂. Outline of wings as in *O. mirabilis*, but as a rule the hindwing with a slight sinus at and below the apex almost as in *O. naemia*-♂. Colour varying from warm tawny (type) to buff, markings as in *O. mirabilis*; in two of our five specimens forewing with large black blotches on disc, and hindwing with submarginal black spots, of which the third and fifth are more proximal and larger than the others.—Underside as in *O. mirabilis*.

The only constant difference is found in the genitalia (Pl. xiv. fig. 13; Pl. xv. figs. 5, 12): Lobes of eighth sternite narrower than in *O. mirabilis*, individually variable, but always narrowing towards apex, sometimes more, sometimes less. Last tergite as in *O. mirabilis*, likewise the clasper and harpe except that the setose base of the curved process P is narrower and the dorsal extension of this swollen portion less distinct. The penis-sheath differs in the apical, helmet-like, hook being much broader than in *O. mirabilis*.

♀ and early stages not known.

This insect evidently represents *O. mirabilis* in the Andesian countries, and the two perhaps will ultimately rank as geographical forms of one species.

Hab. Peru; probably more widely distributed.

In Mus. Tring from: Chanchamayo (A. M. Moss), 1 ♂; Pozuzo, Huanuco, 800–1,000 m. (W. Hoffmanns), 1 ♂; Yahuarimayo, 1,200 ft., ii. iii. 1912 (H. & C. Watkins), 1 ♂; La Union (type) and Tinguri, Carabaya, 2,000 and 3,000 ft., viii. and xii. 1904 (G. R. Ockenden), 2 ♂♂.

In Mus. Brit. from: Chanchamayo, 2,500–3,000 ft., viii.–x. 1910 (H. & C. Watkins), 1 ♂.

In Mus. Joicey from: Rentema Falls, Upper Marañon, 1,000 ft. (A. & E. Pratt), 1 ♂; Chanchamayo, x. xi. 1906, 2 ♂♂.

5. *Oxytenis naemia* Druce (1906) (Pl. vii. figs. 2 ♂, 11 ♀).

♀. *Oxytenis naemia* Druce, *Ann. Mag. N.H.* (7). xvii. p. 412 (1906) (Peru).

This is the commonest and most widely distributed of the species in which the ♂ has the forewing lobate.

♂. Like *O. mirabilis* variable in colouring, usually buffish clay-colour, often with a more or less distinct pinkish or vinaceous-cinnamon tint, occasionally almost tawny-olive, markings as in *O. mirabilis*; forewing often with black discal blotches, in one of our specimens from S.E. Peru such spots on hindwing, not on

forewing ; the three black dots near tornus of forewing very variable, sometimes obsolescent ; oblique line frequently cinnamon and not much contrasting with the ground-colour, in other specimens almost black and very prominent, with intergradations.—As a rule the hindwing bisinuate at apex, but some specimens have scarcely a trace of the two sinus ; the termen from second sinus to anal angle more rounded in some specimens than in others, sometimes almost straight. The tail-end offers the only reliable differences :

Genitalia (Pl. xiv. fig. 14 ; Pl. xv. figs. 2, 13–16) : Sinus of eighth abdominal sternite large, widest distally, lobes narrowed towards apex, variable in size and outline, sometimes very obtuse, sometimes more triangular, the outer surface slanting upwards, the outer margin of the lobe being more dorsal than the inner margin. Lobes of anal tergite shorter than in *O. mirabilis*. Hook F of harpe broader and somewhat shorter and its swollen setiferous base larger. Penis-sheath rather strongly curved, with a dentate, variable, apical process, which in a ventral aspect is curved towards the left side and more or less frontad in some subspecies ; above the opening, i.e. on the apical side of it, a large tooth D, which projects above the orifice ; a large, somewhat variable, ventral lobe partly covers the orifice ; in a view from the dextro-lateral side the surface of the sheath on the right side of the orifice is convex, not cariniform as in *O. mirabilis* ; dentition variable, frequently a tooth at the highest point of curvature of the apical process.

♀. Distribution, frequency of occurrence, and the fact that the Rev. A. Miles Moss has obtained at Pará of this group of species ♂♂ of the above kind, and only specimens of the present ♀ convince us that *O. naemia* really is the ♀ of the ♂ above described. Branches of antenna shorter than in *O. modestia*-♀, acuminate, no patch of short cilia at apices of distal branches (Pl. xviii. fig. 9). Upperside of body and wings dark clay-colour to tawny, more or less irrorated with grey and brownish black scales, sometimes large blackish blotches on disc of both wings ; an oblique line as in ♂ from costal margin of forewing close to apex to abdominal margin of hindwing, which it reaches proximally to two-fifths, crossing hind margin of forewing a short distance beyond middle ; on the outside of this line on forewing at apex a grey line continued by a row of grey lunules, usually bounded with black-brown, in last lunule two black-brown spots and a third, smaller, spot of the same colour at hindmargin ; apex of forewing produced as a well-projecting lobe.—Hindwing in markings similar to that of ♂ ; termen entire, apical and anal angles distinct, anal angle not widened inward as a distinct lobe.

Underside of body and wings (and apex of abdomen above) ochreous yellow or ochreous buff, the termen of both wings usually brighter yellow. On forewing the apical lobe blackish brown, a straight blackish line from apex to hindmargin, variable in width, crossing R³ at two-thirds from lower angle of cell ; about halfway to termen some black spots.—On hindwing the oblique line of forewing continued by a lunate line which is nearly parallel with termen, being slightly less curved than terminal margin, none of its lunules shifted in the direction of the cell ; a submarginal row of black spots, of which the middle one, R²–R³, is shifted basad and less distinct, sometimes the submarginal spots of both wings and the line of the hindwing obsolete or partly obsolete.

Genitalia : The apical margin of the postvaginal sclerite rounded laterally and a little projecting anad ; from this margin obliquely frontad and mesad runs

at each side an obtuse ridge towards the orifice (Pl. xviii. fig. 4), in some specimens the two ridges approach one another closely, in others they remain rather far apart; posterior portion of the sides of this sclerite convex; in front of the orifice a strongly chitinised, high, sharp, transverse ridge covering on the ventral side the large cavity in which the orifice is situated, and curving anad at the sides.

Larva (according to Rev. A. M. Moss, Pará) in fourth instar oily red brown, with many small spines and a short, dark, bifid tail, the dorsal humps larger and lighter on segments 6 and 10, no ocellus on third thoracic segment, which is enlarged sideways; at rest resembling bird-dung, the anterior portion of the body being curved anad. Final (5th) instar (Pl. xiii. fig. 5) dark chocolate, tubercles small and fewer; on third (enlarged) thoracic segment on each side dorsally a spot resembling a half-closed eye when the larva is at rest: consisting of a black pupil and a yellow iris edged with black and bearing a touch of white in the upper corner. Very snake-like, rears up and turns the flexible horn down.

Food-plant: *Palicourea*, *Rubiaceae*.

Hab. Costa Rica to Peru, eastward to Pará. Not known to us from Bolivia, Matto Grosso, Paraguay, and South-East Brazil.

We distinguish the following geographical races by differences in the structure of the penis-sheaths.

(a) *O. naemia orecta* subsp. nov. (Pl. vii. fig. 2. ♂).

♂. Apical process of penis-sheath (Pl. xv. fig. 16) curved obliquely anad and laterad, not frontad, narrow, compressed, more or less twisted, with the posterior edge denticulate. In our only specimen from Costa Rica the process fishtail-shaped, with few teeth; in a specimen from Panama in coll. Dognin shorter, much more dentate; in the specimen from Sta. Marta, likewise unique, the process still shorter, broader, flatter, and strongly denticulate. As in the other subspecies the armature of the sheath is individually variable to a certain extent, we assume this to be the case also in the present subspecies.

♀. We have of this sex a specimen from Sta. Marta; it differs from other ♀♀ of *O. naemia* in the underside being practically devoid of brown irroration. A ♀ from Bogotá in coll. Dognin (Pl. viii. fig. 12) on the contrary is strongly irrorated; it is of a warm ochraceous tawny colour and much resembles Pl. viii. fig. 2 (♂); it is much shaded with purplish black-brown; oblique line very prominent, black dots before tornus of forewing obsolescent as in Pl. vii. fig. 2, almost entirely replaced by grey scaling. Underside ochreous yellow, irrorated with purplish dark brown; oblique line of forewing broad.

Hab. Costa Rica; Panama; Colombia.

In Mus. Tring from: Sixola R., Costa Rica (W. Schaus), 1 ♂, type; Onaca, Sta. Marta, North Colombia, 2,200 ft. (Engelke), 1 ♂, 1 ♀.

In coll. Paul Dognin 1 ♀ from Sta. Fé de Bogotá, and 1 ♂ from Lino, Panama, 800 m. (A. H. Fassl).

(b) *O. naemia aravaca* subsp. nov. (Pl. vii. fig. 11. ♀).

♂. Apical process of penis-sheath compressed, therefore narrow if viewed from the anal direction, its vertical diameter (parallel with the main portion of the sheath) as well as its length and dentition variable, but the apex always curved more or less strongly frontad, forming a hook.

♀. Apparently not different from *O. n. naemia*.

Hab. Venezuela and the Guianas.

In Mus. Tring from : San Esteban, Venezuela (S. M. Klages), 4 ♂♂, 1 ♀; British Guiana, 5 ♂♂, 5 ♀♀, type ♂; St. Laurent de Maroni, French Guiana, vii.1905 (E. Le Mout), 1 ♀.

In Mus. Brit. from : British Guiana (Rodway, Roberts, and Crowley Bequest), 4 ♂♂, 1 ♀.

In Mus. Joicey from : San Esteban, Venezuela, 1 ♂; British Guiana, 1 ♂; French Guiana, 3 ♂♂, 1 ♀.

(c) *O. naemia naemia* Druce (1906).

♀. *Oxytenis naemia* Druce, l.c. (1906) (Peru).

♀. Apical process of penis-sheath curved frontad, forming a hook, its tip broadened and flattened, not compressed (Pl. xv. figs. 13-15); this characteristic less pronounced in Pará specimens.

♀. Apparently not distinguishable from the preceding subspecies.

Hab. Peru, Ecuador, and Amazonia.

In Mus. Tring from Ecuador : Coca, R. Napo, v.-vii. 1899 (W. Goodfellow), 1 ♂.—Peru : Chanchamayo (A. M. Moss), 1 ♂; Pozuzo, Huanuco, 800-1,000 m. (W. Hoffmanns), 1 ♂, 2 ♀♀; La Oroya, R. Inambari, Carabaya, 3,700 ft., x. 1904, xii. 1905 (G. R. Ockenden), 2 ♂♂.—Amazonia : R. Cachiyaco (Stuart), 1 ♀; Fonteboa, vii. 1906 (S. M. Klages), 1 ♂; Teffé, i. 1905 (M. de Mathan), 1 ♂; Manáos and Pará (A. M. Moss), 5 ♂♂, 4 ♀♀, 5 pupae-cases, 1 dry larva.

In Mus. Brit. from Peru : Chanchamayo, 1 ♀ (very pale).

In Mus. Joicey from Ecuador : E. Ecuador (ex coll. Druce), 1 ♂.—Peru : La Merced, Chanchamayo, 3,000-4,500 ft., i. ii. 1920 (C. Watkins), 2 ♂♂; Chanchamayo, 1,000 m., x. xi. 1906, 1 ♂; Chanchamayo, 1 ♂; R. Pacaya, Lower Ucayali, viii. ix. 1912, 1 ♂; Pozuzo, 2,000-4,000 ft. (J. Egg), 1 ♂; "Peru," 1 ♀ (type); R. Yahuarimayo, 1,200 ft., v.-vii. (Watkins), 1 ♂.—Amazonia : R. Madeira, 1 ♂.

6. *Oxytenis leda* Druce (1906) (Pl. vii. fig. 4. ♂; viii. fig. 13. ♀).

♀. *Oxytenis leda* Druce, *Ann. Mag. N.H.* (7). xvii. p. 412 (1906) (Peru).

The species was described from a single ♀. Among the various kinds of ♂♂ from Peru (and Amazonia) there is one which appears to us to belong to *leda* on account of the concentration in patches of the whitish grey scaling of the upperside. The specimen we figure of the ♂ sex does not show these grey patches, but agrees in structure with the others in which the upperside is strongly variegated with grey.

♂. Wings slightly narrower than in *O. naemia*-♂; median lobe of termen of forewing a little broader; hindwing more distinctly bisinuate at apex, the angle separating the bays and the one below the second sinus much more projecting, the termen straight (or nearly so) from this lower angle to anal angle. Otherwise similar to *O. naemia*-♂, but the tail-end different.

Genitalia (Pl. xiv. fig. 15; xv. figs. 3, 6, 17, 18): Sinus of eighth sternite deeper than in *O. naemia*, the lobes therefore longer, shape of lobes individually variable, the inner apical angle more projecting than the outer angle, the latter

effaced in one of our specimens. Tenth tergite much broader than in the previous species, the lobes much shorter. The apical hook of the harpe broader in a ventral aspect, its ventral surface being so extended that the oblique distal edge runs nearly straight from the apex of the hook to its base, the incrassate outer portion of the dorsal surface shining through. Penis-sheath quite different from that of any other species: the extreme tip is curved ventrad as a small dentate lobe, the teeth being directed frontad; in a sinistro-lateral aspect only this group of teeth can be seen of the armature, but at the dorsal side, at a considerable distance from the apex, the sheath is suddenly narrowed. Distally of this point the sheath is widened on the right side into a large triangular lobe, which is curved ventrad. The orifice lies further distad; it is large, being flanked on the ventral side by a short broad lobe L; above its distal end a tooth D.

♀. The type has the upperside of the wings dark burnt-umber brown irrorated with blackish brown and variegated with whitish grey; oblique discal line very faint, scarcely visible on hindwing; on forewing a half-moon before middle of hindmargin, convex on outer side, a row of lunules beyond discal line and some submarginal spots, on hindwing a broken subbasal line of three dots (the line indicated also on forewing), an irregular median line of diffuse lunules and some discal blotches whitish grey, conspicuous; the three black spots near tornus of forewing larger than in any ♀ of *O. naemia* we have seen (individual character).—Underside as in *O. naemia*, but hindwing with the submarginal row of spots extending to costa, i.e. a spot present behind C.

In another specimen, in the Berlin Museum, from Massauary, Rio Maues, Amazons, the whitish grey patches of the upperside are barely indicated and the oblique line is very distinct across both wings.

The chief difference from *O. naemia*-♀ is the more strongly convex termen of the forewing (in consequence of which the discal line is a little farther away from the margin) and the structure of the antenna. The longest branches of the innerside almost as long as four segments of the shaft; in distal half of the antenna the tips of the branches flattened on the basi-lateral side (Pl. xviii. fig. 10) and slightly widened, bearing on this small flattened area a number of very short curved close-set cilia quite different from the long seriated cilia of the branches. Genital plate similar to that of *O. naemia*, the oblique ridges strongly marked and evidently (the specimen not dissected) united in a swelling behind the orifice as in the species from S.E. Brazil (cf. no. 9).

In the British Museum there is a Peruvian ♀ which evidently belongs to the same species, although its colouring is different. Upperside buff shaded with clay colour and irrorated with dark brown, no grey patches; on forewing a continuous dark-brown crenate line outside the faint discal line and not so close to it as in *O. naemia*, in last lunule two small black spots, on disc two diffuse blackish blotches; termen as strongly convex as in type-specimen. Underside ochreous as in type; no distinct dark-brown submarginal spot behind C of hindwing. Antennæ missing except the proximal segments.

Hab. Peru and Amazons.

In Mus. Tring from Peru: La Oroya, R. Inambari, Carabaya, 3,100 ft., iii. 1905 (G. R. Ockenden), 1 ♂.—Amazonia: Fonteboa, v. 1906 (S. M. Klages), 1 ♂; "Amazons" (Bates) ex coll. Felder, 1 ♂.

In Mus. Brit. from Peru: Yahuar Mayo, 1,200 ft., iv. 1912, 1 ♂; Chanchamayo, 2,000 m. (!), x. xi. 1906, 1 ♀.

In Mus. Joicey from Peru, 1 ♀.

In Mus. Berlin from Rio Maues, Amazons, 1 ♀, and Chanchamayo, 1 ♂.

7. *Oxytenis erosa* spec. nov.

♂. Only this sex known. In outline and markings of the wings like *O. leda*-♂, differing in the tail-end. One of the 8 specimens examined is without conspicuous grey markings on the upperside.

Genitalia : Lobes of eighth sternite apically narrower than in *O. leda*, usually triangular with the tip rounded, sometimes the apex truncate. Tenth tergite and harpe as in *O. leda*. Penis-sheath (Pl. xv. figs. 19-21) widened from the bent apicad, flattened and concave on ventral side ; at apex a dentate lobe as in *O. leda*, but larger, and at the right side of it a strong conical tooth, the left margin at about two-fifths from apex to bent with a small tooth, and the margin between this tooth and the apex cariniform and minutely serrate ; there is no large flap as in *O. leda* ; in a ventral aspect (as presented in non-dissected specimens) the sheath broader than in a sinistro-lateral aspect, the large subapical tooth appearing to be larger, and the right-side margin more convex, otherwise much the same as fig. 19. The orifice not visible from the ventral side (as it is in *O. leda*), being shifted on to the dorsal surface ; fig. 21 represents the sheath as seen from the right side.

♀ not known.

Hab. The Guianas.

In the Mus. Tring from British Guiana : Potaro R., vii. 1912 (Dr. P. Rendall), 1 ♂, type ; Rio Demerara, 1 ♂.—French Guiana : Nouveau Chantier, ii., and St. Jean du Maroni, 2 ♂♂ (from E. Le Moul't).

In Mus. Joicey from British Guiana, 1 ♂ ex coll. Druce.—French Guiana : Nouveau Chantier, v. vi., and St. Jean du Maroni, x., 3 ♂♂ (from E. Le Moul't) ex coll. Brabant.

8. *Oxytenis nubila* spec. nov.

♂. In the outline of the wings similar to those specimens of *O. naemia* in which the hindwing is bisinuate at apex, but the angles between and below these bays slightly sharper. Wings and body above clay colour, beneath warmer brown, halfway between tawny-ochraceous and hazel, breast with an ochreous tint. Markings as in the other species ; the last one of the three black dots near termen of forewing above larger than or at least as large as the second.

Genitalia (Pl. xiv. fig. 16 ; xv. figs. 7, 8 ; xvi. figs. 1-3) : Sinus of eighth sternite very broad, the lobes narrowing towards apex, but the apex itself dilated on the dorsal side and this dilatation curved mesad, the lobe being somewhat shaped like a spoon. Lobes of tenth tergite nearly as in Pl. xv. fig. 2, being about the same size and shape as the sinus reversed. Hook of harpe long, narrow, pointed, the setiferous swelling at its base appearing, in a ventral view, underneath the hook as an elliptical lobe which is concave on the ventral side. Penis-sheath less curved than in *O. erosa*, with a similar armature, but the subapical tooth of the right side smaller, the marginal tooth of the left side absent, the apical projection longer.

♀ not known.

Hab. Colombia and Nicaragua.

The two specimens known to us evidently represent two subspecies.

(a) *Oxytenis nubila nubila*.

♂. Upperside as much variegated with white-grey as in *O. erosa* and *O. leda*; the three black spots near tornus of forewing rather large, the last much larger than the others. Lobes of eighth sternite (Pl. xiv. fig. 16) short, their inner surfaces deeply concave, sinus very wide, semicircular. Tip of penis-sheath not sharply pointed (Pl. xvi. figs. 1-3).

Length of forewing : 39 mm.

Hab. Colombia; 1 ♂ in Mus. Tring, without more precise locality.

(b) *Oxytenis nubila acuta* subsp. nov.

♂. *Draconipteris mirabilis* Cram., Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 187. no. 1 (1886) (Nicaragua, "♀" ex err.).

♂. No conspicuous white-grey patches, the three black dots near tornus of forewing small, the last a little larger than the middle one, the first minute. Termen of hindwing less rounded from subapical sinus, anal angle sharper. Lobes of eighth sternite apically narrower and their inner surfaces less concave; the sinus less wide. Hook of harpe more sharply pointed. Extreme tip of penis-sheath curved towards the left side, pointed, forming a short sharp hook.

Length of forewing : 32 mm.

Hab. Chontales, Nicaragua (T. Belt), 1 ♂ in Mus. Brit.

9. *Oxytenis bicornis* spec. nov. (Pl. vii. fig. 3. ♂; viii. fig. 14. ♀).

♂. Wing-shape as in *O. leda*-♂; apex of hindwing distinctly bisinuate, termen from these bays to anal angle slightly rounded. No conspicuous grey patches. Oblique line distinct or rather feebly marked. On underside the crenate discal line of hindwing farthest from termen at R¹, grey costal spot obsolescent or absent.

Genitalia (Pl. xvi. figs. 4-7): Eighth abdominal sternite produced at each side into a long curved spiniform process; sinus very wide. Tenth tergite variable, the lobes as a rule much shorter than they are broad in middle. Harpe as in *O. erosa*. Penis-sheath likewise of the same type as in that species, narrower, the apical dentate lobe and the dorsal subapical tooth much smaller.

♀. So similar to *O. leda*-♀ (cf. p. 162) in the outline of the wings and in the structure of the antenna that I am unable to distinguish the Peruvian and Brazilian specimens with certainty; cf. figs. 13 and 14 of Pl. viii. The question can only be settled when more material from Peru and S.E. Brazil is available for comparison. The two ♀-specimens of the present species we have seen differ from one another much in colour; the one figured is dark burnt umber-brown, with a conspicuous dark brown oblique line on both wings, the grey markings less prominent than in *leda*-♀; the other specimen is ochraceous, the oblique line not conspicuous, of a deeper tawny tint than the ground; both specimens smaller than *leda*-♀, the black spots near tornus of forewing smaller, on underside of hindwing no black submarginal spot below costal vein.

Genitalia (Pl. xviii. fig. 11): the genital sclerite with two strongly marked ridges as in *O. naemia*, these ridges united behind the orifice in a swelling which abruptly terminates on the frontal side (towards the orifice).

Length of forewing : ♂, 29-34 mm.; ♀, 32-34 mm.

Hab. S.E. Brazil.

In Mus. Brit. from : Alto da Serra, Santos, 800 m., iii.1913, 2 ♂♂, 1 ♀, type ♂, and Castro, Parana, 1 ♀ (pale), ex coll. E. D. Jones.

In Mus. Tring. 2 ♂♂ without locality, one of them figured.

10. *Oxytenis peregrina* Cram. (1780) (Pl. vii. fig. 5. ♂).

♀. *Phalaena Attacus peregrina* Cramer, *Pap. Exot.* iv. pp. 30, 251. tab. 305. fig. A (1780) (Surinam).

♀. *Oxytenis peregrina* Cram., Hübner, *Verz. bek. Schmett.* p. 150. no. 1 (1820); Walk., *List Lep. Het. B.M.* v. p. 1183. no. 4 (1855) ("♂" ex err., descr. from Cram.'s fig.); Kirby, *Cat. Lep. Het.* p. 770. no. 4 (1892) (Surinam).

♂. Forewing denticulate, with the antemedian tooth prominent, hindwing strongly bisinuate at apex, a short tail being formed, termen straight from this tail to anal angle, the latter lobate.

Upperside of wings and body deep burnt umber-brown, some submarginal rounded spots on forewing and distal area of hindwing from crenate discal line to termen clay colour; oblique line from near tip of forewing to middle of abdominal margin of hindwing walnut brown.

Underside greyish clay colour, pale ochraceous buff from blackish submarginal line to termen, this line crenate on hindwing and somewhat elbowed.

Genitalia (Pl. xvi. figs. 8-10, 12, 13): Eighth sternite with a median sinus which is about semicircular, the lobes flanking it triangular, their apex rounded and somewhat curved mesad. Lobes of tenth tergite narrower than the sinus, triangular, with the apex broadly rounded. Clasper very distinctive; it is strongly chitinised proximally and ventrally, while the apical dorsal flap is soft; in middle of ventral margin a conical process P¹, the ventral portion of the clasper forming at three-fourths another process (H), which is large, acuminate, slightly longer than the soft dorsal flap; from the dorsal side of this large hook, near its apex, emanates a fold connecting the hook with the dorsal flap and projecting mesad, being only visible if the clasper is viewed from the inner side. Apex of penis-sheath produced ventrad into a pointed, slightly curved, conical process; orifice terminal, flanked on the dorsal side by a ridge which is bent down and below which there is a small projection from the sheath.

♀. The three specimens before me russet-fawn colour, not so dark as Cramer's figure; large subterminal spots on both wings clay colour, subcircular on forewing, elongate-elliptical on hindwing; a prominent walnut brown line from near apex of forewing, reaching abdominal margin of hindwing beyond middle; discocellular tufts large; anal angle of hindwing projecting abdominad as a broad lobe.

Underside clayish buff, ochreous from submarginal line to termen, this line broad and straight on forewing, somewhat thinner, partly crenulate, parallel with termen on hindwing.

Branches of apical half of antenna (except last two segments) very strongly clavate (Pl. xiii. figs. 17-19), truncate, the terminal surface concave, subcentrally densely covered with minute silky cilia, which lie more or less flat on the surface and are all directed towards the base of the antenna; about 25 segments have these clavate branches, on the segments preceding them the incrassation gradually becomes less pronounced, being entirely absent from the branches of the proximal eighteen (about) bipectinate segments.

Genitalia : A broad median stripe of the postvaginal sclerite strongly chitinised, glossy, slightly widened at apex and here convex (Pl. xvi. fig. 12) ; this strip of chitin projecting from between the segments, being visible without dissection ; in the cavity the strip continuous with the ridge which bounds the orifice on the right and left sides ; in front of the orifice a nearly semicircular fold which serves as a movable lid for the orifice, which it completely closes. Pl. xvi. fig. 13 is taken from another, old, specimen with doubtful locality.

Early stages not known.

Length of forewing : ♂, 35 to 40 mm. ; ♀, 44 to 47 mm.

Hab. The Guianas, Amazonia, and Peru ; may be expected to occur also in Venezuela, Colombia, Ecuador, and Bolivia.

In Mus. Tring from : Cayenne, 1 ♀, ex coll. Felder.—Amazonia : Santarem (A. M. Moss), 1 ♂ ; Fonteboa, v. 1906 (S. M. Klages), 1 ♂.—La Union, Carabaya, S.E. Peru, xi. 1904 (G. R. Ockenden), 4 ♂♂.

In Mus. Joicey from : Nouveau Chantier, French Guiana (ex coll. Brabant), 1 ♂, 1 ♀. Essequibo R., British Guiana (Whiteley), 1 ♀.

11. *Oxytenis epiphaea* spec. nov.

♂. Shape of wings as in *O. peregrina*-♂ (Pl. vii. fig. 5), but the apical lobe of the forewing narrower and the minute teeth of the termen between the prominent antemedian tooth and the tornus absent. Upperside of wings almost uniformly mummy brown from base to termen ; on forewing two clayish submarginal spots R^3-M^2 ; on hindwing obsolescent, elongate-elliptical, submarginal, clayish spots R^3-M^2 bounded distally by blackish brown lunules ; oblique line from near apex of forewing reaching abdominal margin of hindwing before middle.

Underside cinnamon, densely irrorated with blackish brown as in *O. peregrina*, black submarginal line on both wings as in *O. peregrina*, subterminal cinnamon spots indicated, but not so distinct as in *O. peregrina*, hardly brighter than the disc, base shading into wood-brown, which is the colour of the underside of the body.

Antenna with 49 bipectinate segments, the branches much longer than in *O. peregrina*-♂, the branch of the inner (= anterior) side of the tenth segment from apex as long as five segments of the shaft, in *O. peregrina*-♂ as long as three segments.

Genitalia (Pl. xvi. figs. 14-18) : Eighth sternite truncate, the angles produced each into a long, thin, spiniform, curved process. Sides of anal tergite incurved, the apical lobes about as large as the median sinus. On the clasper the short conical process found in *O. peregrina*-♂ replaced by a swelling, the apical process of the harpe not so long as the dorsal flap, ending with a sharply pointed, gently curved, and rather long hook. Penis-sheath rather strongly curved twice ; the apex as in *O. peregrina* strongly enlarged ventrad, but this portion not forming a long conical tooth, but remaining broad to the end, flattened underneath, and bearing a small tooth on the left side at the apical edge ; dorsally at the subapical bent the sheath is compressed into an obtuse ridge, and between this ridge and the orifice there is a compressed, triangular, tooth.

♀. We place here two Peruvian ♀♀ in coll. Joicey ; they are much worn on the upperside and therefore appear strongly mottled with buff and burnt

umber-brown. Body above fawn colour, wings shaded with the same tint, oblique discal line deep russet, pale submarginal ovate blotches on both wings as in *O. peregrina*, discocellular tufts conspicuous above and below, anal angle of hindwing lobate.

Underside of body and wings ochre yellow, foretibia and all the tarsi dark brown, not spotted; black line from apex of forewing very conspicuous, parallel with termen on hindwing and about 7 mm. distant from it, somewhat crenate in posterior half.

Antenna of ♀ nearly as in *O. peregrina*-♀, the branches of the nineteen proximal segments pointed, the others clavate with the exception of the last three, the apices not so strongly widened and their ciliate areas more slanting than in *O. peregrina*.

Genitalia (Pl. xviii. fig. 8): Postvaginal sclerite with two anteriorly converging, short ridges nearly as in *O. naemia*-♀; in front of the orifice there is a semicircular, glossy, strongly chitinised flap which forms a kind of lid for the cavity; this lid lies asymmetrically towards the right side and its margin is on this side continuous with a ridge of the postvaginal sclerite, whereas on the left side the cavity is open and the margin of the lid runs deep down into it, not being continuous with the ridge which bounds the cavity on this side.

Length of forewing: ♂, 38 mm.; ♀, 41 to 45 mm.

Hab. Peru.

In Mus. Tring from: La Oroya, R. Inambari, Carabaya, ix.1904, 3,100 ft., dry season (G. R. Ockenden), 1 ♂, type.

In Mus. Joicey from: Huancabamba, 6,000-10,000 ft. (E. Böttger), 1 ♀; Marcapata (from Staudinger), 1 ♀.

12. *Oxytenis plettina* spec. nov.

♂. Two specimens different in size and colouring, but agreeing in structure. The larger one (type) almost exactly like Pl. vii. fig. 5; a little smaller, the termen of the forewing and the apical area and angle of the hindwing dark burnt umber-brown like the median area of both wings; two submarginal spots on forewing and a less distinct lunule below them tawny olive, on hindwing a large area from tail to M² and from fringe to the sharply dentate postmedian crenate line likewise tawny olive, less pale than in *O. peregrina*-♂.

Underside russet-fawn colour; brownish black submarginal line crenulate on both wings except towards apex of forewing; outside the line two rounded spots on forewing and five patches on hindwing from SC² to M² dull ferruginous, this colour extending to termen from SC³ to R³, some black subterminal bars as in other species.

The smaller specimen is above almost entirely deep fawn colour with a pale walnut-brown tint, on forewing two round, pale, submarginal spots, less prominent than in the larger specimen, on hindwing the crenate line visible, the ground outside this line very slightly paler than the median area, the large elliptical patches of *O. peregrina* being but very faintly indicated, and the whole termen being the brown colour of the median area.—Underside pale wood-brown shaded with fawn colour, the blackish submarginal line faint, and the ferruginous subterminal patches obsolescent. In both specimens the branches of the antenna not quite so long as in *O. epiphaea*, but longer than in *O. peregrina*, the inner

branch of the tenth segment from apex being about as long as four segments of the shaft.

Genitalia (Pl. xvii. figs. 1-6) : Eighth sternite medianly incised, the lateral pointed process proximally broader than in *O. epiphaea*, recurved distad. Lobes of anal tergite smaller than the median sinus, the lateral margin of the segment angulate in middle, not so strongly incurved as in *O. epiphaea*. The antemedian setiferous swelling of the clasper more prominent than in *O. epiphaea*, the apical process of the harpe as sharply pointed as in that species, but rather more directed anad. Penis-sheath curved as in *O. epiphaea*; the apex less widened, the orifice not terminal, but dorsal, and the left portion of the ventral margin of the orifice enlarged into a long pointed process which is directed sinistrad and dorsad; on the dorsal side there is a broad lobe at the orifice, dentate at the edge and curved basad away from the orifice.

♀ not known.

Length of forewing : ♂, 28 to 34 mm.

Hab. Ecuador.

In Mus. Tring from West Ecuador : Salidero, 350 ft., ii. iii. 1901, type, and Bulim, 160 ft., xii. 1900 (Flemming & Miketta), 2 ♂♂.

13. *Oxytenis beprea* Druce (1886) (Pl. vii. fig. 10. ♂; viii. fig. 1. ♂).

♀. *Oxytenis beprea* Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 199. no. 4. tab. 21. fig. 3, 4 (1886) (Chiriqui, coll. Staudinger); Kirby, *Cat. Lep. Het.* p. 770. no. 10 (1892).

♂. *Draconipteris mirabilis* Cram., Druce (err. determinationis), *Biol. Centr.-Amer., Lep. Het.* i. p. 187. no. 1 (1886) (partim; Chiriqui); id., *l.c.* ii. p. 422 (1897) (Belize).

♂. Small. Apex of forewing sharply pointed, more so than in any of the previous species with tailed hindwing, termen of forewing either entire or with a small antemedian tooth, anterior sinus of hindwing often almost effaced, tail a little less pointed than in *O. epiphaea* and *pletina*.

Colour very variable. Upperside (Pl. vii. fig. 10) greyish wood-brown (Ridgway, *Nom. Colours*, iii. 19), on forewing a thin dark brown line deeply incurved below cell, excurved in cell and before hindmargin, continued across hindwing; at two-thirds a diffuse darkish band at right angles to costal margin and ending at the oblique line, which is very prominent; outside this line a shadowy line of the colour of the diffuse band, and beyond this a crenate line, in the two bays R³-M² of which there is a fairly conspicuous clayish spot each.—On hindwing beyond middle a thin but distinct dentate line; the space between this line and the deep brown antemedian line darker than the ground, a median band being formed which is narrower in costal third, being narrowest below subcostal; in terminal area some dark brown spots, between them and the dentate line indications of the elliptical patches of *O. peregrina*, fringe dark brown, termen washed with dark brown from tail to anal angle.

A specimen from Chiriqui (coll. Joicey) similar to the above, but the elliptical patches of the hindwing slightly better indicated. A third specimen (Belize, coll. Joicey) pale burnt umber-brown with a shade of fawn colour, with hardly any markings, apart from the walnut-brown oblique line, and the small black discocellular tufts. A fourth (Brit. Honduras, Mus. Tring) clayish ochraceous, with the dark-brown subterminal spots distinct and the rounded patches in the terminal area indicated. A fifth specimen, from Chiriqui (Mus. Brit.), larger,

forewing 35 mm. long, the forewing and the median band of the hindwing blackish walnut brown, base and three subterminal spots on forewing and the rest of the hindwing rufescent hazel (Pl. viii. fig. 1).

Underside varying from wood-brown shaded in terminal area with russet, to russet hazel shaded proximally with wood-brown; a black line on both wings as in *O. angulata*.

Branches of antenna (as in *O. plettina*) longer than in *O. peregrina*, shorter than in *O. epiphæa*, the inner branch of the tenth segment from apex being nearly as long as four segments of the shaft.

Genitalia (Pl. xvii. figs. 7-9): Apical margin of eighth sternite evenly incurved, not triangularly incised in centre, lateral horns as in *O. plettina*. Tenth tergite rather broader than in *O. plettina*. Clasper as in that species. Penis-sheath different: orifice on the ventral side towards the right, partly closed from this side by a soft flap F which can be turned away from the orifice, while the dorsal wall of the orifice is strongly chitinised, hard; from the dorsal margin on the right side, at some distance from the extreme tip, there is a triangular tooth, conical in ventral and dorsal aspects, though it is in reality compressed, being a widening out of the margin of the orifice; this tooth is homologous to the left side subapical process of *O. plettina*, but a twist in the sheath has moved the orifice from the dorsal to the ventral side and turned the left ventral process into a right dorsal one; the size of the tooth variable; the sheath has its bent beyond middle.

♀. Druce's figure is misleading; it is too yellow, and the abdominal margin is figured as being straight, whereas in the type-specimen (which has been very kindly sent to me from Berlin) the anal angle is widened inward as a broad rounded lobe. Upperside of wings wood-brown; discocellular tufts distinct; markings as in *O. peregrina*-♀, but less heavy, the submarginal bars of forewing less curved; the specimen also recalls our Pl. vii. fig. 14, but the discal line is much thinner, termen of forewing much more convex, outside the median line of hindwing a crenate line, and at abdominal margin outside the crenate line three brown spots as in *O. peregrina*-♀.—Underside pale dirty yellow, much irrorated with brown, shading into wood-brown basally, discocellular tufts small, but distinct, dark brown line broad, simple on forewing, crenate on hindwing.—Branches of distal segments of antenna dilated at apex, a little more than in our Pl. xiii. fig. 16, but much less than in *O. peregrina*-♀ (Pl. xiii. figs. 17-19), the ciliate apical surface oblique.—Genitalia similar to Pl. xviii. fig. 6, but the median longitudinal elevated bar less strongly chitinised (in the unique specimen), and the orifice with free margins, without the sort of lid found in *O. peregrina*.

Length of forewing: ♂, 26 to 35 mm.; ♀ 36 mm.

Hab. British Honduras; Panama.

In Mus. Tring from: Orange Walk, viii.1917 (M. G. Palmer), 1 ♂; Brit. Honduras, 1 ♂.

In Mus. Brit. from: Chiriqui, 1 ♂ (Pl. viii. fig. 1).

In Mus. Joicey from: Belize (A. Moloney), 1 ♂, and Chiriqui (Arcé), 1 ♂, both ex coll. Druce.

In Mus. Berlin 1 ♀ (type) from Chiriqui (ex coll. Staudinger).

14. *Oxytenis angulata* Cram. (1775) (Pl. vii. fig. 6. ♂, 7. ♀).

- ♂. *Phalaena Attacus angulata* Cramer, *Pap. Exot.* i. p. 96. tab. 61. figs. E, F (1775) (Surinam).
 ♂. *Phalaena Attacus angulata* Cramer, l.c., Index, p. 151 (1775).
 ♂. *Bombyx angulata* Cram., Fabricius, *Spec. Ins.* ii. p. 172. no. 26 (1781); id., *Mant. Ins.* ii. p. 110. no. 29 (1787); id., *Ent. Syst.* iii. 1. p. 418. no. 34 (1793).
 ♂. *Teratopteris harpago* Hübner, *Verz. bek. Schmett.* p. 151. no. 1683 (1820).
 ♂. *Teratopteris angulata* Cram., Walker, *Lep. Het. B.M.* v. p. 1185. no. 2 (1855); Kirby, *Cat. Lep. Het.* p. 764. no. 1 (1892) (Surinam).
 ♂. *Draconipteris angulata* Cram., Packard, *Monogr. Bomb. Moths*, iii. p. 271 (1914) (Amazons).
 ♀. *Phalaena Attacus zerbina* Cramer, l.c. iii. p. 171. tab. 287, fig. E (1780) (Surinam).
 ♀. *Syssaura zerbina* Cram., Hübner, l.c., p. 150, no. 1574 (1820).
 ♀. *Oxytenis zerbina* Cram., Walker, l.c., p. 1182, no. 1 (1855) (partim; "♂" ex err.); Kirby, l.c. p. 770. no. 1 (1892).

Both sexes very variable in size and colour.

♂. Upperside of body and wings varying from dark sepia brown to clay-colour; fringe of distal margin more or less deep brown, bounded by a thin greyish white marginal line, which is often indistinct. Forewing dentate, tooth R³ prominent, a grey submarginal spot in front of R³, usually an oblique submarginal line from costal margin near apex to about three-fourths of hindmargin, dark brown, on disc a dark cloud, at basal third a transverse dark brown line broken at M and curved from this vein to hindmargin.—On hindwing the proximal line of forewing continued straight to basal fourth of abdominal margin; a discal line from three-fourths of costa to three-fifths of abdominal margin, curved, zigzag, particularly in posterior half, outside this line posteriorly indications of pale elliptical blotches; as on forewing all these markings often hardly traceable.

Underside much paler than upper, shaded with grey, terminal area washed with tawny or ochraceous; dark brown submarginal line of forewing conspicuous, continued across disc of hindwing, where it is usually less prominent; dark brown submarginal blotches on both wings, often indistinct on forewing, between them and discal line on hindwing tawny elliptical markings, vestigial or distinct.

Genitalia (Pl. xvii. figs. 10, 12–15): Eighth sternite truncate-bisinate, sides rounded, median lobe usually reduced to a small tooth. Tenth tergite broad, almost gradually narrower apically, the sides very slightly incurved, apex divided into two rounded lobes usually about the size of the sinus which separates them. Upper flap Cl of clasper of nearly even width, ventrally excised at the apex, the lobe situated proximally of the sinus quite short, the apical lobe longer, rounded, Cl membranous except its dorsal margin, which is strongly chitinised like the rest of the clasper; ventral process P² irregularly flattened, slightly twisted, apex rounded and a little curved laterad. Penis-sheath with the orifice terminal, surrounded by a prominent armature consisting of a dentate lobe on the right side, a short stout ventral hook, and a longer left process directed obliquely frontad, all somewhat variable.

♀. Pale orange buff; a thin ochraceous or gallstone yellow line from costal margin of forewing near apex to middle of abdominal margin of hindwing, on forewing often blackish brown towards apex and on hindwing frequently obsolete; outside this line a row of lunules, indistinct on forewing, usually distinct on hindwing, russet, sometimes widened and diffuse, a submarginal row of russet bars, more or less luniform with the concave side towards base, particularly the

posterior ones of hindwing, terminal area of hindwing shaded with russet or dark brown, the elliptical internervular spaces bounded by the submarginal bars as pale yellow as the proximal area of the wing and therefore contrasting with the darker terminal area. Fringe of both wings sepia colour or tawny olive. Antemedian line indicated or distinct from SM² of forewing to abdominal margin of hindwing, sometimes absent. In some specimens the greater part of the upperside clayish russet. Tip of distal branches of antenna without a cluster of minute cilia.

The lines in outer area of underside olive or drab, broader and bolder than above, one line on forewing, two on hindwing, the pale yellow elliptical spots between the lines of hindwing prominent.

Genital cavity of ♀ very deep, longer than broad, sharply defined, the sides perpendicular, the lateral ridge posteriorly forked (Pl. xviii. fig. 2).

Length of forewing : ♂, 23 to 32 mm. ; ♀, 24 to 34 mm.

Larva resembling bird's dropping, black, each segment with a row of small papillae, some of them tawny, the others whitish grey, lobes of metathorax dirty tawny. On *Randia formosa*. Bred by A. M. Moss at Pará.

Hab. Orinoco, the Guianas, Lower Amazons.

In the Tring Museum a series of both sexes from : Venezuela : Maripa, Caura R., Orinoco, all months from ix. to i. (S. M. Klages).—British Guiana.—Pará (A. M. Moss) ; Amazons (Bates), ex coll. Felder.

In Mus. Brit. from : British Guiana, 2 ♂♂ ; French Guiana, 1 ♀.—Pará, 2 ♀♀.

In Mus. Joicey from : French Guiana.

15. *Oxytenis ferruginea* Walk. (1855).

♀. *Oxytenis zerbina* Cram., Walker (err. determinationis), *Lep. Het. B.M.*, p. 1182, no. 1 (1855) (partim ; Venezuela).

♂. *Teratopteris ferruginea* Walker, *l.c.* v. p. 1184. no. 1 (1855) (Venezuela) ; Kirby, *Cat. Lep. Het.* p. 764. no. 2 (1892).

♂♀. In colour and shape like *O. angulata*, and just as variable, differing in the tail-end of the abdomen.

♂. Tenth tergite (Pl. xvii. figs. 11, 16–18) rather deeply incurved at the sides, subapically rounded-dilated, the apex sinuate, the apical lobes pointed or at least much less rounded at the sinus than outwardly. Membranous portion of clasper less distinctly sinuate below apex than in *O. angulata*, and process P² much slenderer. Penis-sheath very slender, gradually and slightly curved, gradually tapering, bearing an armature of two minute teeth.

♀. Genital cavity large (Pl. xviii. fig. 3), almost evenly concave, flanked by a broad fold, orifice proximal, small, very much smaller than in *O. angulata*, behind it often a distinct tubercle.

Larva found by J. Steinbach in S.E. Bolivia ; similar to that of *O. angulata*, “almost entirely black, very slightly variegated with tawny, resembling bird's dropping, appearing as if damp and being very repulsive.” Pupated on the ground, spinning a few shreds, imago (♂♀) emerged 11 days after pupation.

Length of forewing : ♂, 21 to 34 mm. ; ♀, 29 to 36 mm. (limits of variation probably wider).

Hab. Panama to Venezuela, southward to Bolivia and Matto Grosso.

In the Tring Museum from : Panama, 1 ♀.—Venezuela : Palma Sola, 6 ♂♂; Valencia, 1 ♂; San Esteban, vii.1909 (S. M. Klages), 1 ♂.—Upper Amazons : Fonteboa, x.1906, and Codajas, iv.1907 (S. M. Klages), 2 ♂♂.—Peru : La Union, Rio Huacamayo, Carabaya, 2,000 ft., xii.1904 (G. R. Ockenden), 1 ♂.—Bolivia : Prov. Sará, Sta. Cruz de la Sierra, ii.-vi.1904, and Buenavista, 750 m., viii.1906-iv.1907 (J. Steinbach), 2 ♂♂, 2 ♀♀.—Matto Grosso : Cuyabá, 1 ♂, 3 ♀♀ (rec. from P. Zobrys).

In Mus. Brit. from : Venezuela, 1 ♂ (type), 1 ♀.—Colombia, 1 ♂.—Peru : Yahuar mayo, 1 ♂; Chanchamayo, 1 ♀.

In Mus. Joicey from : Sta. Cruz de la Sierra (J. Steinbach), and Cuyabá to Corumba, Matto Grosso, a series of both sexes.

16. *Oxytenis gigantea* Druce (1890) (Pl. viii. figs. 3, 4. ♂♂).

♂. *Draconipteris gigantea* Druce, *Proc. Zool. Soc. Lond.* p. 502. tab. 43. fig. 4 (1890) (Sarayacu, Ecuador); Kirby, *Cat. Lep. Het.* p. 764. no. 2 (1892) (Ecuador).

♂. Termen of forewing denticulate, all the teeth small, the median one slightly larger than the others. Hindwing strongly bisinuate at apex, the second bay deeper than the first, and angle enlarged as a rounded lobe. This lobe is accidentally turned under in type-specimen (cf. Pl. viii. fig. 3), and therefore not visible in a dorsal view. Colour very variable, upperside ochraceous ochre yellow to mummy brown (Ridgway, *Nomencl. Colours*, iii. 10), in the darkest specimen (Pl. viii. fig. 4) the body almost black; forewing shaded with greyish white, a broad bar on discocellulars, a discal band parallel with this bar and nearly the whole terminal area devoid of white shading. Oblique line across both wings double, the inner line paler than the outer one, in between them a white or whitish line.

Underside brighter than upper, in the dark specimen more or less tawny on wings and body, shading into buff at base of hindwing. The brownish black line which runs from costal margin of forewing close to apex to abdominal margin of hindwing, is even on both wings, not crenulate or dentate. Forelegs not spotted.

Genitalia (Pl. xvii. figs. 20-22, 24): Eighth sternite with a median sinus which is about semicircular, flanked by a short, more or less obtuse process, laterally the sternite produced into a long, tapering, sharply pointed horn. Tenth tergite bilobate, the lobes broader than the median sinus, broader than long, obliquely truncate and usually slightly sinuate, the tergite constricted proximally to lobes. Harpe ending with a long, tapering, pointed process, which curves mesad in a ventral view. Penis-sheath very stout, strongly curved, armed at apex on the ventral side with a longitudinal dentate ridge and on the dorsal side with a strong tooth, which varies in size, being smaller in type-specimen than in our fig. 24 (taken from another specimen, from R. Pastaza, Ecuador).

♀ not known.

Length of forewing : 34 to 39 mm.

Hab. Ecuador and Peru.

In Mus. Joicey from Ecuador : Sarayacu (C. Buckler), 1 ♂; Alpayacu, R. Pastaza, 3,600 ft. (M. G. Palmer), 1 ♂; "Ecuador" (from Staudinger), 1 ♂, very dark.—Peru : Pozuzo, 2,000-4,000 ft. (J. Egg), 1 ♂.

17. *Oxytenis spadix* spec. nov. (Pl. viii. fig. 2. ♂).

♂. Allied to *O. gigantea*. Branches of antenna longer, f.i. the fourth inner branch from apex longer than two segments of the shaft. Upperside of abdomen purplish black-brown from middle to near apex.

Upperside of wings ochraceous, with a slight purplish red tint and shaded with greyish white, an oblique space across apex of cell and another farther distal without grey scaling; the double line which runs from apex of forewing to middle of abdominal margin of hindwing much heavier than in *O. gigantea*, the proximal one brownish black, more prominent than the outer one, which is shaded with grey, in between them a greyish white line; termen black at and below apex; outside the double line a very thin and feebly marked crenate line continued to apex of wing by a thin greyish white line; three small submarginal blotches brown, the last of them lunate, convex on outer side; a greyish white marginal line very thin; fringe dark brown, no black dots near tornus; as in *O. gigantea* marginal tooth R^3 small, the margin being but slightly excised in front of and behind middle.—Hindwing bisinuate at apex, anal angle lobate as in *O. gigantea*; outside the double line the usual markings: a faint, deeply crenate, line, then follows an ochraceous space as pale as the middle of the termen, and further a submarginal row of dark brown spots, a thin greyish white marginal line obsolete in middle.

Underside paler than upper, ochreous yellow towards base, irrorated with purplish black-brown; on forewing a submarginal line from apex, brown-black, single, crossing M^2 8 mm. from termen, margin at and below apex brown-black, the line slightly angulate at R^1 .—Hindwing without the well-defined line of *O. gigantea*, bearing instead a diffuse narrow blackish band, which extends from near apex to middle and is continued by some triangular or angle-shaped spots, the distance (9 mm.) of these spots from the termen being about three times that of the band at costa, whereas in *O. gigantea* the line is posteriorly about as near the termen as anteriorly; halfway to termen a row of blackish spots, more or less triangular and diffuse, no spot between M^2 and abdominal margin, anterior half of termen tawny ochraceous, its posterior half as far basad as the post-discal spots shaded with drab-grey.

Genitalia (Pl. xvii. figs. 19, 23): The two lobes of the tenth tergite triangular, with the apex rounded. Eighth sternite asymmetrical in the only specimen known to us, the pointed process of the right side being much shorter than that of the left side and bearing a tooth; the median sinus, which in *O. gigantea* is almost semicircular, is narrow and very deep, being about twice as deep as it is wide distally. Penis-sheath (not taken out; its exact structure therefore not known) as far as can be ascertained similar to that of *O. gigantea*, but the row of small teeth missing.

Length of forewing: ♂, 36 mm.

Hab. Colombia.

In coll. Paul Dognin 1 ♂ from Alto de las Cruces, Western Cordillera, 2,000 m., ii.1909 (A. H. Fassel).

Key to the species of *Oxytenis* :

I. Males.

1. Termen of fore- and hindwing even 2
 Termen of forewing with large antemedian lobe, hindwing rounded or at apex bisinuate 3
 Termen of forewing with or without teeth, in the former case the antemedian tooth symmetrical, not curved backwards; hindwing with tail before middle of termen 5
2. Hindwing below with basal half yellow, contrasting with the outer half and bounded by a lobate line (the lunules composing it convex on outer side) *O. modestia*
 Hindwing below almost uniform in colour, with a continuous, broad, black discal line *O. albilunulata*
3. Lobes of eighth sternite truncate *O. mirabilis*
 Lobes of eighth sternite rounded-triangular 4
 Lobes of eighth sternite drawn out into a long thin process *O. bicornis*
4. Apical armature of penis-sheath in the shape of a helmet, of which the lower margin is dentate (ventral aspect) *O. sobrina*
 Apical process of penis-sheath narrow, projecting far beyond the orifice, with a large tooth above the orifice and a large lobe on the left side of the orifice; hindwing bisinuate at apex *O. naemia*
 Penis-sheath widened before apex on the right side into a large triangular lobe; hindwing subtruncate, at apex bisinuate *O. leda*
 Penis-sheath with a small dentate apical lobe which is bent frontad, at the right side of the lobe a fairly large tooth, on the back of the sheath from apex basad a minutely serrate ridge which terminates with a tooth; hindwing as in *O. leda* *O. erosa*
 Penis-sheath nearly as in *O. erosa*, but without a dorsal tooth; lobes of eighth sternite short and so twisted that they turn their concave uppersides towards each other; hindwing rounded, at apex bisinuate *O. nubila*
5. Termen of forewing with a large tooth in middle 6
 Termen of forewing with a very small tooth or without teeth 10
6. Foretibia conspicuously spotted 7
 Foretibia not distinctly spotted 8
7. Anal tergite gradually narrowed, sides not distinctly incurved *O. angulata*
 Anal tergite very distinctly incurved and then strongly excurved *O. ferruginea*
8. Eighth sternite with short obtuse lobes; terminal area of hindwing clay-colour, rest dark brown *O. peregrina*
 Eighth sternite with very long, thin, pointed processes 9
9. Penis-sheath without long spiniform apical tooth *O. epiphæa*
 Penis-sheath with long spiniform apical tooth *O. plettina*
10. Sides of anal tergite strongly incurved, apical lobes truncate *O. gigantea*
 Anal tergite almost gradually narrowed, apical lobes triangular with the apex rounded off 11
11. Eighth sternite medianly deeply incised *O. spadix*
 Eighth sternite medianly not incised *O. beprea*

II. Females (known of only 9 species).

- 1. Branches of distal half of antenna without cluster of minute cilia at apex 2
 Branches of distal half of antenna with cluster of minute cilia at apex 4
- 2. Forewing above with 2 or 3 black spots before tornus at outer side of oblique line ; upperside of both wings almost uniformly tawny brown (variable in depth of tint), without yellow patches *O. naemia*
 Forewing above without black spots before tornus ; in dark terminal area of hindwing above and below large yellow elliptical patches, often the greater portion of the upperside yellow like the underside 3
- 3. Genital cavity sharply defined, with perpendicular sides *O. angulata*
 Genital cavity large, gradually deepening, rather indefinite *O. ferruginea*
- 4. Apex of distal branches of antenna hardly at all enlarged, anal angle of hindwing not lobate 5
 Apex of distal branches of antenna considerably enlarged, anal angle of hindwing projecting abdominad 6
- 5. No black dots on forewing above before tornus ; on underside of hindwing a discal row of separate blackish brown lunules of which the fourth is more distal than the two before and the two behind it *O. modestia*
 With two or three black dots on forewing before tornus at outer side of oblique line *O. leda* and *O. bicornis*
- 6. Apex of distal segments of antenna quite abruptly clavate, truncate ; genital sclerite with a conspicuous longitudinal median strip of chitin *O. peregrina*
 Apex of distal segment more gradually and not so strongly enlarged, the ciliate end-surface oblique in lateral aspect ; genital sclerite with median strip of chitin *O. beprea*
 Apex of distal segments gradually enlarged ; genital sclerite without longitudinal raised strip of chitin 7
- 7. Tawny line of upperside of hindwing, reaching abdominal margin in middle ; discocellular tufts conspicuous above and below *O. epiphæa*
 Tawny line reaching abdominal margin at three-fifths ; discocellular tuft minute on forewing, absent from hindwing *O. albilunulata*

3. Genus : **Homoeopteryx** gen. nov. (ex Felder 1874 indescr.).

Homoeopteryx Felder, *Reise Novara*, tab. 94. *Erklärung*, p. 5 (1874) (no diagn.); Kirby, *Cat. Lep. Hel.* 804 (1892).

We employ the Felders' indescript name for our conception of a genus which differs from *Oxytenis* in the following essentials :

♂♀. Wings entire, similar in the sexes in contours and markings, but termen of forewing more rounded in ♀. No discocellular tuft of raised scales. Antennae and branches longer than in *Oxytenis*, with longer and thicker bristles, the last two (♀) or three (♂) segments ventrally with a number of sensory cones which in ♂ are placed at the margin of a somewhat hand-shaped projection ; in ♀ (Pl. xiii. figs. 20-23) the previous 12 to 16 segments with the shaft strongly dilated ventrad and gradually laterad, a segment recalling an anvil, the flat, ventral surface being nearly square, or transverse, or longer than broad and clothed with a dense pile of short cilia, the segment previous to these modified ones with a ventral process ; the apical projections of the distal segments of *Oxytenis* not present in *Homoeopteryx*. Upper cell-angle of forewing (Pl. xiii. fig. 3) acute,

vein supporting apical lobe of wing deeply deflexed in both sexes, SC¹ from cell at some distance from apex, R¹ from upper cell-angle, sometimes from subcostals close to cell; in hindwing SC close to C for some distance, gradually diverging, SC² and R¹ on a rather long stalk. Penis-sheath (Pl. xix. fig. 7) without the guiding rod of *Oxytenis*.

Early stages not known.

Hab. Panama to Bolivia and British Guiana; few specimens in collections.

Genotype: *malecena* Druce (1886).

Five species are known.

We cannot make *sysauroides* Feld. the genotype of this genus, as the only known specimen has neither antenna nor abdomen and could not serve for drawing up the above description.

1. *Homoeopteryx malecena* Druce (1886).

♂. *Oxytenis malecena* Druce, *Biol. Centr.-Amer., Lep. Het.* i. p. 198. no. 3. tab. 21. fig. 2 (1886) (Chiriqui).

Oxytenis malacena (!) Druce, Kirby, *Cat. Lep. Het.* p. 770. no. 9 (1892).

♂. Upperside cream-buff; a straight line from apex of forewing crosses hindmargin of forewing beyond one-third and reaches abdominal margin of hindwing before one-third; about halfway to termen large elliptical patches, usually not conspicuous, paler than the interspace between them and the oblique line, bounded on the proximal side by a crenate line and on the terminal side by a less distinct scalloped line; on hindwing a submarginal row of blackish dots.

On underside a blackish crenate submarginal line edged with grey, oblique on forewing, 8 to 10 mm. distant from termen at M² and running up to apex, on hindwing slightly curved, about twice as far away from termen posteriorly than at costa; on the basal side of this line on both wings a diffuse ochraceous band nearly parallel with the line, touching lower cell-angle on hindwing.

Genitalia (Pl. xviii. figs. 13-17): Eighth sternite truncate-emarginate, the angles produced into a very long spine. Lobes of tenth tergite widely apart, with the apex obtuse, flattened above and slightly twisted. Process of harpe gently curved inwards, widened at apex and truncate; clasper ending with a slender, spathulate lobe which reaches beyond the apex of the anal tergite. Penis-sheath longest on the dorsal side, the opening on the ventral side, dorsal margin (= extreme tip of sheath) rounded, no teeth or processes. Penis-funnel with a sharply pointed process at each side.

♀. Similar to ♂. Forewing a little broader and its distal margin slightly more rounded. Markings essentially as in ♂. Colour of upperside in the two specimens before me yellowish buff and clayish wood-brown, 15 or 16 distal segments of the antenna have the shaft enlarged ventrally, the surfaces of these enlarged portions broader than long, a few of them as long as broad (Pl. xiii. figs. 20-23).

Genital sclerite with sharp apical edge, which is rounded laterally; surface of sclerite rather flat, concave at the side of the orifice and slightly convex behind it. In front of the orifice a transverse ridge, concealing the orifice, the margin of this ridge rather thick, smooth.

Length of forewing: ♂, 35 mm.; ♀, 34 mm.

Hab. Panama, Trinidad, and British Guiana; doubtless more widely distributed.

(a) *Homoeopteryx malecena malecena* Druce (1886).*Oxytenis malecena* Druce, l.c.

♂♀. Oblique line of upperside thin. Lobes of anal tergite of ♂ more or less strongly curved towards each other at apex.

Hab. Panama.

In Mus. Tring 1 ♂ from Chiriqui (from Staudinger).

In Mus. Brit. 1 ♂ from Bugaba, Chiriqui, type.

In Mus. Berol. (coll. Staudinger) 1 ♂, 1 ♀ from Chiriqui.

(b) *Homoeopteryx malecena prona* subsp. nov.

♂♀. Oblique line thicker than in the previous subspecies. In ♂ the two lobes of the anal tergite very slightly converging, also thicker in a vertical sense (Pl. xviii. figs. 13, 14).

Hab. Trinidad and British Guiana.

In Mus. Tring from Port of Spain, ii. 1897 (Dr. Percy Rendall), 1 ♂, type, and British Guiana, 1 ♀.

In Mus. Joicey from British Guiana, 1 ♀.

2. *Homoeopteryx major* spec. nov. (Pl. vii. fig. 15. ♂).

♂. Like *H. malecena*, but larger. Upperside wood brown, oblique line almost gallstone yellow on inside. Fringe of both wings chestnut. Underside strongly irrorated with blackish brown, submarginal line strongly crenate, edged with greyish white. Lobes of anal tergite as in *H. m. prona*, but stouter, basally wider, apically rather narrower. Penis-funnel (Pl. xviii. fig. 18) with broad obtuse processes. Eighth sternite (Pl. xviii. fig. 19) essentially as in *H. malecena*.

♀. Dark ochraceous shaded with russet, oblique line blackish brown with a brighter ochraceous proximal edge, space between this line and the crenate line darker, being shaded with russet brown, as is also the termen of forewing posteriorly and costal margin distally; as in ♂ some small grey markings outwardly edged with dark brown are indications of a subbasal, much broken, line. Underside clayish tawny, as in ♂ much irrorated with blackish brown, crenate line as in ♂. Fringe of both wings chestnut.

Antenna with only eleven distal segments ventrally enlarged, and the ventral surfaces of the enlarged portions much longer than broad. Genital sclerite as in *H. malecena*, but the apical margin projecting laterally as a short, broad, rounded lobe, and the antevaginal transverse ridge (Pl. xviii. fig. 12) more curved, its obtuse margin being rounded laterally and feebly incurved medianly.

Length of forewing: ♂, 40 mm.; ♀, 41 mm.

Hab. Peru.

In Mus. Tring 1 ♂, type, from S. Domingo, Carabaya, 6,000 ft., ii. 1902 (G. R. Ockenden).

In Mus. Joicey 1 ♀ from the same place, xi. 1904 (G. R. Ockenden).

Possibly a subspecies of *H. malecena*.

3. *Homoeopteryx syssauroides* Feld. (1874)

♀. *Homoeopteryx syssauroides* Felder, *Reise Novara, Lep.* tab. 94. fig. 6 (1874) (no loc.); Kirby, *Cat. Lep. Het.* p. 804 (1892) (hab. ?).

The type and only known specimen is without antennae and abdomen, but the legs prove it to be a ♀. There are three labels on the pin (we have replaced the pin, as it was corroded): one small, green, bearing the locality "Brésil"; this label was pressed close to the body and probably overlooked by Felder; the second label bears the name and the third a short description of the outline of forewing and the length of the abdomen. The abdomen which is now on the specimen is that of a Notodont, I think, and certainly does not belong to the specimen.

The Felders' figure is coarse, the submarginal blotches being much too pale and prominent; the last blotch of the forewing is more uniform in the specimen, and the second and third from the abdominal margin of the hindwing are larger than in the figure.

Upperside dark russet brown, the submarginal blotches pale ochraceous shaded with dark brown. The oblique line walnut brown, with a narrow grey outer edge, more distal than in the previous forms, reaching hindmargin just beyond middle on forewing and at middle on hindwing.

Underside russet hazel, the submarginal blotches paler than above, three on forewing, of which the one at tornus extends to near fringe; the brownish black line which bounds the band of blotches thick, on forewing straight, very faintly lunulate posteriorly, on hindwing distinctly lunulate.

Length of forewing: 36 mm. (probably, the apical lobe broken on both forewings).

Hab. "Brazil."

In Mus. Tring 1 ♀, type, ex coll. Felder.

4. *Homoeopteryx elegans* spec. nov. (Pl. vii. fig. 9. ♂).

♂. Body and upperside of wings cream colour, palpi and forelegs washed with ochraceous rufous, upperside of palpi dark brown, but tip of last segment creamy.

Forewing with a subbasal russet line from base of M^2 obliquely outward to hindmargin, curved basad at hindmargin, connected with a curved line in cell which runs from near base of M^1 obliquely basad to costal margin; at lower cell-angle a round deep brown spot, base and costal margin and a series of submarginal blotches cream-colour, rest of wing shaded with russet, disc more or less diffusely creamy, this colour accentuated on the veins; oblique line crossing hindmargin at three-fifths, clayish tawny, paler on basal side, on its outer side a greyish line and a dark brown one, both very thin, obsolescent, three large submarginal blotches cream-colour, slightly shaded with russet ochraceous, the two anterior ones bearing a black dot outwardly, in front of them two small spots, and between them and apex a thin creamy line; fringe walnut brown.—Line of hindwing submedian, reaching abdominal margin 11 mm. from base and 14 from anal angle, curved basad at costal margin; between it and base an oblique line from abdominal margin to cell, inclining basad; discal crenate line distinct, nearer to the submedian line than in *H. syssauroides*, the interspace between these two

lines russet ochraceous up to R^1 ; submarginal cream-coloured patches large, outwardly bounded from C to R^3 by a diffuse brown zigzag line, the last blotch by a heavier, slightly S-shaped bar, the two largest blotches bearing a black dot outwardly as on forewing; fringe walnut brown.

Underside of forewing russet with a distinct chocolate tint, base and hind-margin buff, submarginal blotches very prominent, pale buff yellow, the oblique blackish submarginal line which bounds them on the basal side straight.—Hindwing pale buff yellow slightly shaded with chocolate russet along costal margin; the elliptical patches united as a large pyriform band, bounded on the basal side by a black band which touches lower cell-angle, where it is 3 mm. broad, and becomes thin and crenulate towards costa; on the terminal side the pale yellow area is bounded by a row of black dots connected with each other by a diffuse line, which is zigzag anteriorly, obsolescent between R^1 and M^2 , and replaced by a Z-shaped bar before abdominal margin.

Genitalia (Pl. xix. figs. 1–7): Eighth sternite almost truncate, with a semi-circular sinus, the angles produced into a short spine. Sinus of anal tergite much deeper and narrower than in *H. malecena*, the lobes convergent in middle, divergent at apex, narrow, but not pointed. Apical lobe of clasper distinctly widened, rounded; process of harpe not widened at apex, which is also rounded. Penis-sheath slightly broadened apically, truncate, the right margin of the narrow membranous ventral space with two teeth which point towards the left. The lobes of the penis-funnel very short and broad, each nearly a rectangular triangle. Manubrium M (Pl. xix. fig. 5) of ninth sternite (= saccus) long, somewhat curved upwards at end.

Length of forewing: 39 mm.

Hab. Peru.

In Mus. Tring 1 ♂ from La Oroya, R. Inambari, 3,100 ft., ix. 1904 (G. R. Ockenden).

I thought at first that this specimen was the ♂ of *H. syssauroides*; it bears some resemblance to that species in the submarginal blotches of both wings being very prominent, but the differences between the two specimens are much greater than in the sexes of *H. malecena* and *H. major*. Moreover, in the ♂♂ of these species the crenate line of both wings, above, is farther away from the oblique line than in the ♀♀, whereas in *H. elegans*-♂ the interspace between these lines is narrower than in *H. syssauroides*-♀.

The specimen of *H. elegans* has the basis of the branches of the left (inner) side of the right antenna swollen.

5. *Homoeopteryx divisa* spec. nov. (Pl. viii. fig. 10. ♀).

♀. Bristles of antenna long, twelve segments with enlarged ventral surfaces counting from the third segment from apex, these ciliate surfaces a little broader than long except the proximal two, the segment previous to these with a conical ventral process as in the other species.

Upperside of wings russet walnut brown from base to oblique line, this colour very strongly contrasting with that of the terminal area, which is buff shaded with cinnamon rufous; oblique line of forewing cinnamon rufous, rather brighter than the proximal area, on its outside a thin grey line upon which follows a thin and somewhat diffuse dull walnut brown line, the grey line reaches

hindmargin at three-fifths; the submarginal rounded blotches not prominent, bounded on the proximal side by lunules which are much nearer the oblique line than in *H. malecena*, *H. major*, *H. syssauroides*, and even *H. elegans*; the last three blotches longer than broad, blotches R^1 - R^3 circular, and before them a small transverse spot, all these blotches bounded on the terminal side by dark brown bars or dots.—Median line of hindwing tripartite as the line of forewing, touching lower cell-angle and curving basad costally; submarginal blotches not quite so far distant from median line as in *H. syssauroides*, partly buff yellow, but not much contrasting with the rest of the terminal area, as the yellow colour is diffuse and extends to the margin except at costal and anal angles; a row of blackish dots indicates the outer boundary of the blotches; fringe dull walnut brown.

Underside pale dull hazel, pale orange buff from submarginal line to termen, this line thin, darker than the proximal area, slightly blackish on forewing and almost straight, at the proximal side of the line some grey shading from middle to apex, the line on hindwing slightly lunulate, at R^3 midway between cell and termen; on both wings the posterior angle suffused with hazel, some subterminal bars and spots diffuse, the two dots R^3 - M^2 of hindwing more distinct than the other spots.

Head, thorax, base of abdomen (rest of abdomen missing), and legs the colour of the proximal wing-area.

Length of forewing: 34 mm.

Hab. Bolivia.

In Mus. Joicey 1 ♀ from Mapiri (from Staudinger).

Key to the species of *Homoeopteryx*:

1. Oblique line of upperside of wings crossing hindmargin of forewing before middle 2
- This line crossing hindmargin of forewing at three-fifths 3
2. In ♂ underside feebly irrorated with dark brown, process of penis-funnel pointed; in ♀ 16 segments of the antenna ventrally enlarged 1. *H. malecena*
Larger (length of forewing about 40 mm.), underside of both sexes strongly irrorated with brownish black; in ♂ processes of penis-funnel obtuse; in ♀ about 12 segments of the antenna ventrally enlarged 2. *H. major*
3. Body and nearly the whole upperside of hindwing cream-colour; forewing above with dark brown round discocellular spot 4. *H. elegans*
Body and wings russet brown, the submarginal blotches conspicuous, ochraceous shaded with brown 3. *H. syssauroides*
Wings russet walnut brown from base to oblique line, terminal area buff, strongly contrasting 5. *H. divisa*

The second family of aberrant Saturnioideans referred to on p. 135 comprises a few genera of the Chilean coast districts and one genus of the Andes, and differs from all the other Saturnioideans in the possession of an ancestral character in the neuration. This distinction has been entirely overlooked by all who have tried to define what constitutes a Saturnian.

Family : **CERCOPHANIDAE** fam. nov.

Costal vein of hindwing connected with cell by an oblique bar (Pl. xix. fig. 8), as is commonly the case in *Eupterotidae* and *Bombycidae*.

In the majority of the *Saturnioideae* the costal vein of the hindwing diverges from the cell from the base. But besides the *Cercophanidae* there are other exceptions ; for instance, among the *Agliinae* there occur a few species in which the costalis runs for a short distance parallel with the cell, then touches it (as in many *Lymantriidae*), and finally diverges from it very gradually.

The species united in this family fall into two groups, which have little in common besides the cross-bar.

A. Subfamily : **Cercophaninae** subf. nov.

A group peculiar in the imagines as well as the early stages.

Proboscis absent, its vestiges under the upper lip more or less scaled. Upper lip transverse, projecting, rounded in a dorsal aspect, its anterior margin obtuse or sharp. Third segment of palpus distinct. Frons with long hair, which hangs over the eye. Antenna bipectinate in both sexes, branches long and dorsal, but in the ♀ of one genus short and lateral, always bearing an apical bristle, ventral surface different according to species. Epiphysis of foretibia large in ♂, reaching to the apex of the foretibia, partly scaled, its inner edge incurved before middle, in ♀ reduced in width or altogether absent. Mid- and hindtibiae with a pair of short, claw-like, serrate spurs as in the bulk of the Saturnioideans ; tarsi with some spines on the ventral surface, particularly at the apices of segments I to IV ; claws serrate.

Neuration (Pl. xix. fig. 8) : In forewing the cell extending to near middle of wing, SC¹ from cell, SC² absent, SC³ off SC⁴ near apex of wing, stalk of SC^{4,5} about as long as the cell is broad ; R¹ from upper cell-angle or from subcostal stalk close to cell ; upper and lower cell-angles acute, about equal in size ; R² in or above centre ; apex of SM³ coalescent with SM². Hindwing : no precostal vein ; cell longer than half the wing apart from tail, its upper angle very obtuse, lower angle acute, cross-vein D³ being very oblique ; R² from before centre ; SM³ absent.

Larva : only the last stage of two species known ; no prominent tubercles, some fine hairs, each segment with a long lateral hair thickened at the tip ; head small, thorax gradually increasing in width, the metathorax being the widest and being dorsally produced forward into a high peak ; preanal segment with a short peak directed backward ; a raised lateral line from peak of metathorax to tail.

Food-plants : *Aristotelia*, *Tiliaceae* ; *Maytenus*, *Celastraceae*, *Cryptocarya* ; *Lauraceae* ; and *Hydrangea*, *Saxifrageae*.

Cocoon very hard, open at one end or at both ends, the edge of the opening smooth, recalling the larva-case of *Perophoridae*. Pupa of ♂ *C. venusta* with large antenna sheath, no legs showings, labrum almost circular, proboscis-sheath (in this case really the sheath of the labial palpi) broad, only half as long again as it is broad at base ; cremaster with or without spines.

Only four species are known, one of them being the smallest Saturnioidean described.

It is much to be desired that the first stages of the larvae should be studied.

As one of the species (*venusta*) is no great rarity in the neighbourhood of Valparaiso, there should be no difficulty in supplying the want.

In the first two genera the ♂♂ are tailed and the antennae of the ♀♀ have long pectinations; in the third genus the ♂ is not tailed, and the antenna of the ♀ has short lateral processes. The cocoon is open at the upper end in the first genus¹), and at both ends in the second; unknown of the third genus. Larva known of the first genus only.

1. Genus : *Cercophana* Feld. (1862).

♂. *Cercophana* Felder, *Verh. zool.-bot. Ges. Wien*, p. 496 (1862) (type: *frauenfeldi*); Kirby, *Cat. Lep. Het.* p. 765 (1892); Paek., *Monogr. Bomb. Moths*, iii. p. 26 (1914).

♂. *Eudelia* Philippi, *Ent. Zeit. Stettin*, xxv. p. 91 (1864) (type: *aristoteliae*); Kirby, *l.c.* p. 764 (1892).

♂♀. *Cercophora* (!) Feld., Butler, *Trans. Ent. Soc. Lond.* pp. 17, 103 (1882).

♂♀. Proximal segments of antennae not carinate beneath; branches long in both sexes, but much longer in ♂ than in ♀. Edge of labrum rounded off. ♂ tailed, in ♀ the tail represented by a short, broad, stumpy projection, which is sometimes almost effaced. Penis-sheath large, without armature; no anal sternite in ♂.

Larva recalling that of the African genus *Pselaphelia*, but in the latter the anterior conical horn is placed on the pronotum instead of the metanotum as in *Cercophana*, and the posterior horn of *Pselaphelia* is long and anal instead of short and preanal. In both species of *Cercophana* the larva is pale green, the head whitish green, the raised side-line yellow, or anteriorly blue and white and posteriorly yellow and rose colour. Very sluggish, clinging tightly to the food-plant. At rest the head almost hidden in the prothorax, pro- and mesothorax contracted and held downwards (cf. Edmonds, *Trans. Ent. Soc. Lond.* 1882, p. 103).

Cocoon open at the upper end, according to the specimens in the B.M., but said by Izquierdo to be hermetically closed; firmly fastened lengthways to a twig, on its outer surface a quite irregular network of silk threads glued on to the cocoon. Pupa moderately glossy, cremaster a small tubercle with hooked spines (Izquierdo), abdominal segments transversely and somewhat irregularly plicate in the region of the spiracles, no other prominent surface structure.

Hab. Chile, coast districts.

Two species.

1. *Cercophana frauenfeldi* Feld. (1862).

Cercophana frauenfeldi Felder, *Verh. zool.-bot. Ges. Wien* xxv. p. 496 (1862) (♂, Valparaiso); iid., *Reise Novara*, *Lep.* tab. 95. fig. 6, *Taf.-Erkl.* p. 3 (1874); Mab., *Miss. Cap Horn*, *Lép.* p. 11. no. 9 (1888) (Orange Bay—cocoon not this species); Kirby, *Cat. Lep. Het.* p. 765 (1892); Stand., *Hamb. Magelh. Sammelr.*, *Lep.* p. 51 (1899); Sonthon., *Essai Classif. Lép.* iv. p. 76. tab. 24. fig. 4. ♂, 5. ♀ (1904); Coek., in Paek., *Monogr. Bomb. Moths*, iii. p. 498 note (1914).

Cercophora (!) *frauenfeldi* Feld., Butler, *Trans. Ent. Soc. Lond.* p. 17. tab. 1. fig. 5. larva (1882) (Valparaiso, Feb.-March; descr. of ♀; food-pl. *Cryptocarya peumus*); Edmonds, *ibid.*, pp. 103, 104 (1882) (descr. of larva and cocoon); Bartl.-Calv., *An. Univ. Chile*, lxi. p. 15 (separ.) (1886).

Cercophana venusta ab. *frauenfeldi* Feld., Rothschild, *Nov. Zool.* ii. p. 47 (1895).

¹ Izquierdo, *An. Univ. Chile*, p. 40 (1895, issued 1896 ?), says that the cocoons are hermetically closed in *Cercophana* (and *Eudelia*). In the two cocoons in the B.M., from which the imagines have emerged, the upper end is widely open, the edges of the opening are quite smooth and do not at all look as if the opening had resulted from the emergence of the imago; it is only for this reason that I describe the cocoon of *Cercophana* to be open at the upper end; corroboration of Izquierdo's statement, as well as observations on the mode of emergence, would be most welcome.

♂♀. Clayish ochraceous buff, termen of forewing and anal area of hindwing, on upperside, washed with dark russet; lines of wings scalloped; no pale discocellular spot on forewing. Foretibial epiphysis present in ♀ as well as ♂, but much narrower in ♀.

Genitalia of ♂ (Pl. xxi. figs. 11, 12, 17): Anal tergite broad, entire at apex, gradually widening from apex to base, apex slightly curved downwards; a round median tubercle, in middle of apical margin of ninth tergite, and close to it at each side on tenth tergite, a short high ridge similar to a ribbed shell with dentate margin, the exterior side of these two projections concave. Clasper divided by a narrow ventral incision into two lobes, ventral lobe (H) elongate-triangular, with the apex rounded, apical lobe (Cl) very broad. Penis-sheath subcarinate ventrally; side-line of larva yellow, mesonotum and the three following segments with a pinkish median spot.—Food-plant: *Cryptocarya peumus*; larva found by Edmonds in November. Cocoon almost elliptical in outline.

Hab. Chile.

In Mus. Tring 1 ♂ (type) from Valparaiso.

In Mus. Brit. a pair and a cocoon from the same locality.

2. *Cercophana venusta* Walk. (1856).

Lonomia venusta Walker, *List Lep. Het. B.M.* vii. p. 1756 (1856) (♂, Chile).

Bombyx ? *aristoteliae* Philippi, *Linn. Entom.* xiv. p. 286 (1860) (♀, Valdivia, 1. on *Aristotelia maqui*).

Eudelia rufescens Philippi, *Ent. Zeit. Stettin*, xxv. p. 91 (1864) (♂, Valparaiso, March); Maassen & Weym., *Beitr. Schm.* fig. 75. ♂, 76. ♀ (1881) (Valparaiso); Preiss, *Abbild. Nachtschm.* p. 8. tab. 11. fig. 1 (1888); Kirby, *Cat. Lep. Het.* p. 765. no. 2 (1892).

Eudelia vulpes Butler, *Trans. Ent. Soc. Lond.* p. 18 (1882) (♂, Coral, March); Kirby, *Cat. Lep. Het.* p. 765. no. 3 (1892); Bartl.-Calv., *An. Univ. Chile*, lxi. p. 15 (separ.), no. 124 (1886).

Eudelia venusta Walk., Butler, *l.c.* (Valparaiso, March; = *aristoteliae* = *rufescens*); Edm., *ibid.* p. 103 (1882) (descr. of larva and cocoon, on *Maytenus chilensis*); Bartl.-Calv., *An. Univ. Chile*, lxi. p. 15 (separ.), no. 123 (1886); Reed, *Act. Soc. Chile*, i. p. 68 (1892) (= *aristoteliae* = *rufescens*).

Eudelia aristoteliae Phil., Maassen & Weym., *l.c.* fig. 101. ♂, 102. ♀ (1885) (= *vulpes*); Kirby, *l.c.* no. 5 (1892).

Eudelia daphnea Maassen & Weym., *l.c.* fig. 103. ♂ (1895) (Chile ?); Kirby, *l.c.* no. 4 (1892).

Cercophana venusta Walk., Rothschild, *Nov. Zool.* ii. pp. 46, 47 (1895) (partim); Sonthon., *Essai Classif. Léop.* iv. p. 74. tab. 25. fig. 1. ♂, 2. ♀, 3. ♂, 4. ♂, 5. ♀ (1904).

Cercophana rufescens Phil., Packard, *Monogr. Bomb. Moths*, iii. p. 27. tab. 31. fig. 14. larva (1914).

Cercophana frauenfeldi Feld., Watson, in Packard, *l.c.* p. 498. tab. 111. fig. j. ♂ (1914) (Valdivia.—

This mistake in identification is due to the error in *Nov. Zool.* ii. p. 46).

♂♀. Varying from maize yellow to almost chestnut red, the majority of specimens more or less shaded with pink; postmedian line even, not scalloped; on forewing a conspicuous white discocellular spot margined with a brown line. Foretibial epiphysis absent in ♀. Tail of ♂ longer than in *C. frauenfeldi*.

Genitalia of ♂ (Pl. xxi. figs. 13, 16, 18): Anal tergite dorsally swollen, transversely corrugated, apex widened, broadly emarginate, divided into two lobes, which project oblique laterad and are longer than broad, with the sides almost parallel and the apex rounded. Clasper divided as in *C. frauenfeldi*, but the free lobe (H) of the ventral sclerite broader and shorter, and the apical lobe (Cl) longer than in that species. Penis-sheath with a conspicuous round swelling ventrally at the apex (Pl. xxi. fig. 16).—♀. Eighth tergite with the edge slightly more strongly chitinised than the previous segments, its scaling whitish, contrasting with that of the seventh segment; eighth sternite (= postvaginal sclerite)

a transverse, smooth plate with free apical edge, no tubercles, ridges, or other conspicuous prominences in the cavity between sternites vii. and viii., orifice central.

Larva larger than in *C. frauenfeldi*, the raised side-line pale blue above and white beneath on metathorax, replaced by three lines (blue, black, orange) on next segment, and pale yellow above and rose-colour beneath on the other segments; no pinkish dorsal spots, but a dorsal line paler green than the rest of the body (Edmonds).—Food-plant: *Maytenus chilensis* and *Aristotelia maqui*.

Cocoon larger than in *C. frauenfeldi*, distinctly pyriform, and more grey instead of yellowish. The irregular network of its outer surface blackish in the British Museum specimen, whereas in *C. frauenfeldi* it is the same colour as the cocoon.

Length of forewing: ♂, 32 to 37 mm.; ♀, 35 to 40 mm.

Hab. Chile.

In Mus. Tring 10 ♂♂, 7 ♀♀ labelled Chile, 1 ♂ Rancagua.

In Mus. Brit. two pairs (inclusive of type of *vulpes*) from Valparaiso and Coral.

2. Genus: *Neocercophana* Izquierdo (1896).

♂♀. *Neocercophana* Izquierdo, *An. Univ. Chile*, p. 36 (1895, but evidently issued 1896) (type: *philippii*).

♂♀. Very close to *Cercophana*; shaft of antenna sharply carinate beneath, the carina ending with a glossy apical cone on the distal segments; branches long in both sexes, but more especially in the ♂. Transverse margin of labrum sharp. Third segment of palpus longer than in *Cercophana*. Foretibial epiphysis long in both sexes, narrow in ♀; sole of fifth segment of foretarsus of ♀ with few scales. Underscales in proximal half of wings larger than in *Cercophana*, most of them with four teeth, long scales of fringe more deeply slit, nearly all with three teeth. ♂ tailed, in ♀ the termen of the hindwing incurved before middle, the tail being represented as in ♀ *Cercophana* by a broad rounded projection.

Larva not known. Cocoon open at both ends, fusiform, the top end gradually narrowing into a chord by which it is suspended from a twig of the plant; below the upper, elongate, opening a circular diaphragm with small central hole. Pupa with a projecting cremaster which is about twice as long as broad, widened apically, truncate, with the angles acute and projecting.

Food-plant: *Hydrangea scandens* Poepp. = *Cornidia integerrima* Hook. & Arn.

Hab. Chile.

One species.

1. *Neocercophana philippii* Izquierdo (1896).

Neocercophana philippii Izquierdo, *An. Univ. Chile*, p. 38. tab. 3. figs. 16. ♂, 17. ♀, 18. cocoon (1895, evidently issued in 1896) (Chillan, Araucania).

♂♀. Upperside dark burnt umber-brown, darker in ♂ than in ♀, proximal two-thirds of hindwing russet-hazel, terminal area of both wings and basal area of forewing more or less shaded with dispersed white scaling, particularly in ♂; on forewing an antemedian line and a discal one, and on hindwing a discal one even and more or less white, the discal line nearly parallel with termen.

Underside dark tawny in ♂, a duller russet tawny in ♀.

Genitalia of ♂ (Pl. xxi, figs. 14, 15, 19) : Tenth tergite divided to about two-fifths from apex into two lobes, which are directed distad, very slightly curved downwards, gradually and slightly narrowed apicad, obtuse, rather smaller than the sinus which separates them. The ventral portion (H) of the clasper ending with a narrow obtuse lobe, which is separated from the clasper (Cl) by a much wider sinus than in *Cercophana*, clasper longer than in that genus. Penis-sheath armed with spicules at the mouth.—♀. Postvaginal sternite membranaceous for the greater part, medianly slightly more chitinised, this portion rounded; cavity shallow and rounded; in front of the orifice, and forming the anterior wall of the cavity, a transverse smooth tubercle.

Early stages see above.

Length of forewing : ♂, 24 mm. ; ♀, 26 to 31 mm.

Hab. Chile (probably from about Chillan southward).

In Mus. Tring 2 ♂♂, 6 ♀♀ labelled Chile.

3. Genus : **Microdulia** gen. nov.

♂♀. Antenna with long branches in ♂; in ♀ the branches short and lateral (Pl. xix, fig. 10), the segments broader than long, the distal ones with a broadish apical ventral process which lies flat on the segment following and bears at the edge minute sensory cones. Epiphysis of foretibia absent in ♀. Hindwing without tail in both sexes, but termen slightly elbowed in ♂.

Early stages not known.

Hab. Chile.

One species.

1. **Microdulia mirabilis** Roths. (1895).

Cercophana mirabilis Rothschild, *Nov. Zool.* ii. p. 46. tab. 10. fig. 6. ♂, 7. ♀ (1895) (Chile, in coll. Staudinger); Pack., *Monogr. Bomb. Moths*, iii. p. 28 (1914) (copy of R.'s descr. ; "probably the type of quite a distinct genus").

♂. Upperside of forewing dark russet tawny, with a darker discal line and a white discocellular spot, fringe spotted with yellowish white on both wings.—Hindwing orange, a discal line and a broad terminal band the dark colour of the forewing.

♀. Upperside of forewing buff, a transverse line before basal third, slightly incurved in cell, at right angles to hindmargin, widest at costal margin, outside it a less distinct line, posteriorly fading away, a broad line touching lower cell-angle, slightly curved in S-shape, also widest costally, and a thin scalloped discal line about parallel with termen russet tawny ochraceous, discocellular spot buff margined with russet tawny ochraceous, terminal area ochraceous buff; terminal margin somewhat undulated, spotted with buffish white on both wings.—Hindwing buff, without antemedian line, with a diffuse median line and an almost even discal line.

Genitalia of ♀ (Pl. xxi, fig. 20) : Orifice median and distal, the sclerite convex from orifice frontad, a sort of half cylinder being formed, sides of sclerite deeply concave.

Length of forewing : ♂, 20 mm. ; ♀, 22 mm.

Hab. Chile.

In Mus. Tring 1 ♀ from Chile.

2. Subfamily : **Janiodinae** subf. nov.

Proboscis strong, especially in ♂. Pilifer with bristles. Spurs of mid- and hindtibiae scaled to apex, only the extreme tip bare, strongly chitinised, claw-like. R¹ of forewing from cell, the cross-vein between it and the subcostal stalk almost longitudinal, the upper cell-angle therefore very obtuse ; SM³ of hindwing present as in *Oxytenidae* and many other *Saturnioideae*.

One genus, the species of which recall the Old World *Eupterotidae* by the size, shape, and markings of the wings.

Early stages not known.

4. Genus : **Janiodes** gen. nov.

♂♀. Head and thorax shaggy. Palpus long, third segment somewhat porrect. Proboscis strong, rolled in, its papillae small, conical, pointed, restricted to the apical third of proboscis. Labrum slightly convex ; a deep hole at each side of it. Shaft of antenna compressed in both sexes, more or less strongly carinate beneath, at least the distal segments, proximal segments shorter than high, distal ones much longer than high ; ventral apical angle (with the exception of the proximal segments) produced, bearing a long glossy sensory cone, the process projecting considerably on the distal segments previous to the last ; all the segments (except the scape) bipectinate in ♂, the branches very long and slender, with one or two long apical bristles, a subapical dorsal one and usually one or more farther down the dorsal side, the branches subdorsal in origin on the proximal segments, dorsal on the distal segments, here the two branches of a segment originating quite close together ; in ♀ the antenna simple, shaft nearly as in ♂, in transverse section the distal segments triangular and the proximal ones ovate, the branches of the ♂ represented in ♀ by a slight lateral ridge which bears one or two long bristles (Pl. xix. fig. 9).

Epiphysis of foretibia non-scaled, reaching to apex of tibia in ♂, much reduced in ♀ ; fifth foretarsal segment of ♀ with scaling in centre ; soles of tarsi with spines, particularly in hindtarsus ; mid- and hindtibiae with one pair of spurs, of which the inner one or both are long (occasionally a small proximal pair present on hindtibia). Pulvillus larger than in *Cercophanidae*.

Wings different in outline in the sexes, without tail, in the ♂ broader and with the termen more rounded than in the ♀. Forewing with two or three black discocellular dots, often replaced by two large spots, of which the posterior one is the larger.

Neuration : In forewing four subcostals, SC¹ from cell long before apex (Pl. xix. fig. 8), SC² absent, SC³ short, from SC⁴ near apex of wing, SC⁴ and SC⁵ on a short stalk ; cross-vein D¹ between this subcostal stalk and R¹ almost longitudinal and fairly long, the upper cell-angle therefore very obtuse ; SM³ forming a basal fork with SM², its apex not free. In hindwing no precostal tubular vein, SC² and R¹ separate or stalked together (position individually variable) ; SM³ vestigial or absent.

Genitalia of ♂ : Clasper large, entire or divided into two lobes, outer surface evenly chitinised, no distinctly separate ventral sclerite.

Early stages not known.

Hab. Andes, from Colombia to Bolivia.

Genotype : *Janiodes laverna* Druce (1890, as *Oxytenis*).

The species of this genus were mostly described as *Oxytenis* and *Lonomia*. The peculiar Eupterotoid basal neuration of the hindwing removes them at once from both these genera.

1. *Janiodes laverna* Druce (1890) (Pl. vi. fig. 11. ♂, 12. ♀).

♀. *Oxytenis laverna* Druce, *Proc. Zool. Soc. Lond.* p. 502. tab. 43. fig. 5 (1890) (Ecuador).

♂. *Oxytenis nigropuncta* id., *Ann. Mag. N.H.* (7). xvii. p. 411 (1906) (Peru).

The largest known species of the genus, individually so variable that Strand gave six names to the six males which were before him (cf. *J. laverna nigropuncta*). The majority of specimens have on the forewing two small black discocellular spots, while in a minority these spots are more or less strongly enlarged, the lower spot having sometimes a diameter of 5 to 6 mm.

♂. Upperside varying from clayish buff to blackish sepia-brown, shaded with greyish white scaling, which usually is concentrated on the veins, forming discal streaks; for markings of upperside cf. Pl. i. fig. 11; the nearly straight proximal postmedian line of this figure not always distinct and in the northern race more undulate.

Underside much shaded with cinnamon-rufous; across both wings, parallel with the termen, a more or less diffuse band varying from ferruginous to orange-buff and even buff, and bearing a darker zigzag line corresponding to a similar line of the upper surface.

♀. Upperside buff or orange-buff, in the specimen figured (Pl. i. fig. 12) the central third of the forewing, the base and termen, and on hindwing the basal three-fifths from abdominal margin to cell, russet and russet-tawny; lines essentially as in ♂, but shape of wings different (cf. figure).

Underside orange-buff, shaded with ferruginous, in outer half two conspicuous undulate lines and a subterminal, diffuse, band deeper brown.

Genitalia of ♂ (Pl. xix. figs. 11-17): Anal tergite with a very strongly compressed apical process which is channelled along its narrow dorsal surface, the dorsal outline in a lateral aspect being almost semicircular. Clasper with a broad, rounded, median, ventral lobe, and a large pointed apical lobe which, in a view from the outer side, appears claw-shaped, but in reality is broad to near apex and then gradually narrowed to form a hook; manubrium of ninth sternite (= saccus) short and broad. Penis-funnel (P.-F.) formed by a prominent sclerite, concave on upperside (adapted to the penis-sheath, which lies above it) and convex below, the apex sinuate and denticulate, with the angles projecting distad, and the base shallowly impressed. Penis-sheath without teeth, the apex produced ventrad. Above the penis-sheath a transverse ridge which runs frontad at the sides.—♀. The larger distal half of the postvaginal sclerite membranous (Pl. xxi. fig. 10); the cavity proximal, bounded in front by a minutely serrate ridge concealed under the margin of the external, scaled, seventh sternite; from the cavity, on each side, a ridge runs obliquely outward and backward, and a second, lower, ridge, parallel with the first, is placed a little farther anad; in and behind the cavity the surface irregularly wrinkled.

Length of forewing: ♂, 36 to 48 mm.; ♀, 45 to 48 mm.

Early stages not known.

Hab. Colombia to Bolivia.

Two subspecies.

(a) *Janiodes laverna laverna* Druce (1896).

♀. *Oxytenis laverna* Druce, l.c. (1890) (Intaj, Ecuador); Kirby, *Cat. Lep. Het.* p. 770, no. 11 (1892) (Ecuador).

♂. *Lonomia pulverosa* Strand, *Arch. Naturg.* lxxviii. A. 9. p. 150 (1912) (Macas, Ecuador); id., in *Lep. Niepell.* i. p. 18. tab. 4. fig. 12 (1914) (Macas).

♂♀. In both sexes the first discal line of the forewing above undulate. Three of the four specimens (2 ♂♂, 2 ♀♀) which we have seen of this subspecies have large black discocellular spots on the forewing, and the ♂ in coll. Joicey has in addition a small round black discocellular spot on the hindwing; the second ♂ (in coll. Dognin) has a narrow discocellular bar on the forewing, accentuated at the ends.

Hab. Colombia; Ecuador.

In Mus. Joicey from San Antonio, West Colombia, 5,800 ft. (G. M. Palmer), 1 ♂, and Intaj, Ecuador (Buckley), 1 ♀, type.

In coll. Paul Dognin from Alto de las Cruces, West Cordillera, Colombia, 2,200 m. (A. H. Fassel), 1 ♂; Aquadila, Bogotá, vi. 1918 (Fassel), 1 ♀.

(b) *Janiodes laverna nigropuncta* Druce (1906) (Pl. vi. figs. 11. ♂, 12. ♀).

♂. *Oxytenis nigropuncta* (!) Druce, l.c. (1906) (Oconeque, S.E. Peru, 7,000 ft.).

♂. *Lonomia pulverosa* abs. *pauperata*, *desquamata*, *macromacula* (!), *duplinota*, *contrastata* Strand, *Arch. Naturg.* lxxviii. A. 9. p. 150 (1912) (Chanchamayo; Chaco, Bolivia).

♂♀. Proximal discal line of upperside of forewing straight, at least from centre to hindmargin; this line indistinct in ♀, as it is in ♀ of the previous subspecies.

Hab. Peru; Bolivia.

In Mus. Tring from Peru: Huancabamba, N.E. of Cerro de Pasco (E. Böttger), 6 ♂♂; S. Domingo, Carabaya, 6,000 ft., iii. iv. 1902, and La Oroya, R. Inambari, Carabaya, ix. 1904 (G. R. Oekenden), 2 ♂♂, 1 ♀.

In Mus. Joicey from Peru: R. Tono, Central Peru, 1,200 ft. (Watkins), 1 ♂; Oconeque, Carabaya, 7,000 ft. (G. R. Oekenden), 1 ♂, type.

Also in coll. Paul Dognin from Huancabamba.

2. *Janiodes dognini* spec. nov. (Pl. viii. fig. 6. ♂)

♂. Body and wings greyish drab. Frons dark reddish brown, palpus dark ferruginous, tarsi beneath buffish, foretibia blackish brown, shaft of antenna pale ochraceous buff.

Upperside of forewing for the greater part shaded with dispersed bluish silvery white scales, which are slightly glossy in sunlight; at upper and lower cell-angles a minute dark chocolate spot and between them and also on the proximal side of the posterior spot some dots of the same colour, all these small markings bordered with white; a line about $\frac{1}{2}$ mm. broad commences at costal margin nearly 9 mm. from base, slightly angulate at C and then almost straight to hindmargin, which it reached 6.5 mm. from base; before apex of cell a second conspicuous line excurved below costal margin, incurved in cell, angulate just outside base of M^1 and further postically slightly incurved; on the proximal side of this line at a distance of nearly 2 mm. from it a less prominent line of the same shape; outside cell another line, well marked, thinner towards costa than posteriorly, excurved below costa and then straight to hindmargin, the median interspace, which bears the discocellular dots, 5 mm. broad at costal margin and

3 mm. at hindmargin ; outside this line at a distance of 1 mm. from it a fainter line parallel with it and anteriorly slightly undulate ; then follows at the same distance a very faint line ; and halfway between the prominent discal line and the termen a thin but very distinct regularly undulate line which is partly outlined in buff on the outer side ; at termen a diffuse white line and an indication of a short white submarginal line at apex ; all the other lines Vandyke brown ; fringe hazel brown.—Hindwing similar to forewing ; the median interspace 2.5 mm. broad at abdominal margin, somewhat silvery up to cell and bounded on the basal side by the antemedian line, which extends only to the cell, on the proximal side of this line, at the abdominal margin traces of two other lines ; discal line somewhat rounded-excurved in middle, touching lower cell-angle and then slightly incurved ; on its outer side, parallel with it, two slightly undulate vestigial lines, and as on forewing a regularly undulate line in terminal area ; fringe and diffuse white scaling along it as on forewing.

Underside drab, both wings without line in basal half, with a minute blackish discocellular dot ; in outer half a Vandyke brown discal line much less distinct than above, faintly undulate, on forewing fading away posteriorly, outside it a faint trace of a line, and in terminal area a crenate-undulate line, fainter than the corresponding line of the upper side and bounding a diffuse ferruginous band which, on the forewing, is distinct only at apex of wing, whereas on the hindwing it is fairly conspicuous from near costal margin to near abdominal margin.

Neuration as in *J. laverna*.

Genitalia (Pl. xix. figs. 13–15) : Tenth tergite less strongly compressed than in *J. laverna*, its dorsal surface broader, considerably widening proximally and produced at each side of the median channel into a short broadish lobe which projects frontad ; in a lateral aspect the apical portion of the sclerite much more abruptly curved downward than in *J. laverna*. Clasper with the proximal lobe narrower than in *J. laverna* and less rounded, and the distal lobe much less acuminate than in that species ; on the inside, as a continuation of the posterior margin of the proximal lobe, a rather high transverse ridge which bears a row of small spiniform teeth at the side towards the penis-funnel. Penis-sheath large, without armature.—Specimen not dissected ; the above particulars obtained by relaxing the claspers and bending one of them sideways.

Length of forewing : 32 mm.

Hab. Colombia.

In coll. P. Dognin 1 ♂ from Monte Tolima, Central Cordillera, 3,200 m. (A. M. Fassl).

3. *Janiodes ecuadorensis* Dognin. (1890) (Pl. viii. figs. 5. ♀, 11. ♂, 15. ♂).

♂. *Oxytenis* (?) *ecuadorensis* Dognin, *Le Natural*. xii. p. 50 (1890, February) (Loja) ; id., *Lép. Loja*, p. 54. tab. 5. fig. 7 (1891) ; Kirby, *l.c.* p. 770. no. 12 (1892) (Ecuador).

♂. *Nephodia* (?) *monacharia* Maassen, in Stübel, *Reis. S. Amer., Lep.* p. 47. no. 15. p. 162. no. 161, tab. 5, fig. 16 (1890, October) (Pichincha, Ecuador).

♂. *Oxytenis monacharia* Maass., Kirby, *l.c.* p. 935 (1892) (Ecuador).

♂. *Lonomia monacharia* Maass., Druce, *Ann. Mag. N.H.* (7). xiii. p. 247 (1904).

♂. *Oxytenis ecuadorensis* var. *flexuosa* Dognin, *Hét. Nouv. Amér. Sud.* ii. p. 51 (1911) (Monte Socorro, 3,400 m., près Cali).

♂♀. *Oxytenis ecuadorensis* Dognin, *ibid.* p. 51 (1911) (Colombia, ♀ with simple ant.).

♂. Upperside blackish sepia-brown shaded with fawn, thorax dull ferruginous chocolate ; before middle of forewing a band of lines curved from costal

to hindmargin, indented on the veins, a grey line separating the two outer dark lines, and the inner line being often bounded on the basal side by ochraceous clay-colour, this colour sometimes forming a broad antemedian band; on disc at one-fourth to two-fifths from lower angle of cell a nearly straight, sometimes curved, sometimes undulate, triplicate line from costa to hindmargin, the proximal and the discal lines dark brown separated by a grey line; a dark brown submarginal crenate line accentuated by short buff dashes on the veins, usually a buff spot in the arch M^1-M^2 of the crenate line.—The discal and crenate submarginal lines continued across hindwing in most specimens, sometimes the hindwing without markings; russet in basal half and blackish brown distally.

SC^2 from cell or stalked with R^1 .

Pl. viii. fig. 15 represents the type-specimen from coll. Dognin.

Underside Vandyke brown (Ridgway, *Nomencl. Colours*, iii. 5), an obsolescent discal line double, brown and grey, often only the grey line present, and sometimes both missing; a crenulate submarginal line distinct, or only indicated by a row of vein-dots, or absent; veins in terminal area of both wings more or less cinnamon.

♀. Much paler than the ♂. Head smaller. Wings much narrower and longer, termen more oblique, abdominal margin of hindwing shorter than costal margin.

Genitalia of ♂ (Pl. xx. figs. 1-6; xxi. fig. 7): Process of anal tergite much broader than in *J. laaverna*, the edges considerably raised on the dorsal side, broadly concave along middle, the process resembling the spout of a jug. Clasper broad and short, triangular, with the apex rounded; no separate harpe, no ventral process. Penis-sheath thicker than in *J. laaverna*, the base (= foot) longer, the apical ventral dilatation shorter, the membrane of the orifice with a patch of short spines. Penis-funnel (P-F) continued anad at the sides of the penis-sheath and terminating with a pointed process each side; above each process a broad lobiform sclerite.—♀. The genital cavity bounded in front by a plicate ridge, the inside of the cavity smooth, but behind it the sclerite convex and transversely plicate (Pl. xx. fig. 16), this portion of the sclerite appearing very dark.

Length of forewing: ♂, 29-32 mm.; ♀, 34 mm.

Early stages not known.

Among the ♂♂ occur specimens (Pl. viii. fig. 11) which are a little larger (forewing 33 to 34 mm.), and have a broad ochraceous clay subbasal band on the forewing, the discal line undulate, and the terminal area (of forewing) for the greater part clay-colour. This is ab. *flexuosa* Dogn., *l.c.* I do not see any difference in structure. We have a specimen of it from San Antonio.

Hab. Colombia; Ecuador; Peru.

In Mus. Tring from Colombia: San Antonio, Western Cordillera, 5,800 ft., xi. xii. 1907 (G. M. Palmer), 3 ♂♂; Cañon del Tolima, Central Cordillera, 1,700 m., iii. 1910 (A. H. Fassl), 1 ♂ (slightly different in anal tergite). Peru: Huancabamba, 6,800 ft. (E. Böttger), 4 ♂♂.

In Mus. Joicey from Colombia: San Antonio (G. M. Palmer), 1 ♂.

In coll. Paul Dognin from Colombia: San Antonio and Rio Aguaca, 2,000 m., Cauca and Monte Tolima (A. H. Fassl), a small series of both sexes; ab. *flexuosa* from Monte Socorro near Cali, Cauca.

4. *Janiodes russea* Dogn. (1912) (Pl. vi. fig. 13. ♂; viii. fig. 8. ♂, type).

♂. *Oxytenis russea* Dognin, *Hét. Nouv. Amér. Sud*, ii. p. 50 (1912) (Colombia: San Antonio, 2,000 m.; Alto de las Cruces, near Cali, 2,300 m.).

♂. More reddish russet than *J. ecuadorensis*; subbasal area of forewing proximally of and in between antemedian lines more or less russet ferruginous; markings as in *J. ecuadorensis*, but the distal one of the antemedian lines nearer apex of cell. Termen of both wings undulate.

Genitalia (Pl. xx. figs. 7-12; xxi. fig. 8): Anal tergite with three apical processes instead of one, the median process ventral, setiferous, pyramidal, directed downward, the other two dorsal, flattened, separated by a narrow sinus, their inner margins parallel, the outer margins rounded. Clasper very broad, divided by a broad round apical sinus into two rounded lobes, of which the upper one is slightly the shorter and broader. Penis-sheath hardly at all dilated ventrad at apex, subapically on the left side with a large tooth and close to it some small teeth, and on the right side with a patch of minute teeth placed on a swelling. Penis-funnel (P-F) with a ventral bifid sclerite, broader at the base of the sides than long, the sides slanting and the ventral surface deeply impressed proximally; from this sclerite anad extends on each side a ridge, the two ridges connected at same distance from the anus by a low transverse sinuate ridge, the upper angles of the lateral ridges projecting.

Length of forewing: 27 mm.

♀ and early stages not known.

Hab. Colombia.

In Mus. Tring from: Monte Tolima, 3,500 m., ii. 1910 (A. H. Fassl), 1 ♂.

In Mus. Joicey from: San Antonio, Western Cordillera, 5,800 ft., xii. 1907 (M. G. Palmer), 1 ♂.

In coll. Paul Dognin from: San Antonio, 2,000 m., xi., and Alto de las Cruces, near Cali, 2,300 m., iii. (A. H. Fassl), several ♂♂.

5. *Janiodes virgata* spec. nov. (Pl. viii. fig. 9. ♀).

♀. Antenna and abdomen missing. Head and thorax above and beneath raw umber colour with a chestnut tint.

Upperside of forewing drab brown (Ridgway, *Nomencl. Colours*, iii. 18), shaded with white, and with mummy-brown transverse bands which are devoid of scattered bluish white scaling: a trace of such a band 3 mm. from base, three broad lines separated from each other by two thin white lines form a broad antemedian band 6 to 7 mm. wide, almost straight from costal to hindmargin, being costally very slightly curved basad, its inner margin anteriorly 7 mm. from extreme base and posteriorly 6 mm., its outer margin crossing cell proximally of point of origin of M^1 ; no black discocellular dots; median interspace of wing at costa about 5 mm. wide, at hindmargin 4 mm., bounded by a straight band about 3 mm. broad and divided lengthwise by two thin white lines which are close together and of which the outer one is obsolescent (like the inner one of the antemedian band), the brown band being composed of three brown lines of which the proximal one is as broad as the two others together; then follows a thin crenate line; termen without distinct white scaling; fringe mummy brown;

margin entire, slightly incurved below apex, tornus broadly rounded, without indication of an angle.—Hindwing triangular, with the apex and tornus rounded off, costal margin as long as abdominal margin, termen entire, straight in middle; pale mars-brown (i.e. fawn-colour with a walnut-brown tint) from base, the termen shaded with mummy brown, no markings.

Underside of forewing pale drab, nearly fawn-colour, shaded with ferruginous, veins and costal margin ferruginous, a faint trace of a ferruginous discal line.—Hindwing ferruginous from base to discal line; this line deeper ferruginous, about 1 mm. broad, parallel with termen, but more evenly curved, 8 mm. from termen, outside it a faint trace of a scalloped line, terminal area shaded with pale drab, veins ferruginous; fringe blackish as above.

Neuration: In forewing R^1 not from cell, but from stalk of subcostals; in hindwing R^1 from cell, lower cell-angle less than 90° .

Length of forewing: 30 mm.

Hab. Colombia.

In coll. P. Dognin 1 ♀ from Paramo del Quindiu, Central Cordillera, 3,800 m. (A. H. Fassel).

6. *Janiodes bethulia* Druce (1904) (Pl. vi. fig. 13. ♂; viii. fig. 7. ♂, type).

♂. *Lonomia bethulia* Druce, *Ann. Mag. N.H.* (7). xiii. p. 247 (1904) (Huancabamba, 6,000–10,000 ft.)*

♂. Similar to *J. ecuadorensis*; forewing partly with a cinnamon-rufous or chestnut tone, the antemedian lines less curved, discal triplicate line very straight, touching lower cell-angle or nearly, three brown discocellular dots, submarginal undulate line very distinct, a band in between the antemedians and proximally of them as well as the two-thirds or three-fourths of the termen dirty ochraceous or yellowish cinnamon.—Ground-colour of hindwing as on forewing, variable in the depth of the brown tint; discal line close to cell, often crossing lower cell-angle, much less distinct than on forewing, submarginal undulate line vestigial or obsolete.

Genitalia (Pl. xxi. figs. 1–6, 9): Anal tergite with a broad flat apical lobe which is about half as long again as broad and evenly rounded at apex; it bears on the upperside from base to near apex an obtuse high median crest which is highest towards its distal end, being here strongly rounded in a lateral aspect. Clasper very broad and obtuse, entire. Penis-sheath dorsally on each side with a subapical, somewhat rounded, minutely denticulate process which is convex on the outer side and partly concave on the inner side, being curved towards the sheath; apical portion of the sheath beyond these processes longitudinally plicate. Penis-funnel (P-F) deeply divided into two long horns, the lateral margins of which are each continuous with a longitudinal ridge, which ends with a large, apically rounded, somewhat twisted flap, the two flaps contiguous, well projecting above the concave area which lies between them and the anus.

Length of forewing: 25 to 27 mm.

♀ and early stages not known.

Hab. Peru.

In Mus. Tring from: Huancabamba, 6,000–10,000 ft. (E. Böttger), 2 ♂♂.

In Mus. Joice from the same place, 2 ♂♂, incl. of type.

Key to the species :

1. Termen of wings entire ; anal tergite of ♂ not divided 2
 Termen of wings undulate ; anal tergite of ♂ divided *J. russea*
2. Proximal discal line costally as strongly curved basad as the distal antemedian line ; anal tergite of ♂ strongly compressed 3
 Discal line not distinctly curved basad from upper radial vein to costal margin ; anal tergite of ♂ not compressed 4
3. Distal antemedian line of forewing incurved in cell, discal line close to lower angle of cell ; anal tergite of ♂ dorsally towards base with a double, heart-shaped, projection *J. dognini*
 Proximal discal line of forewing distant from lower angle of cell ; anal tergite of ♂ without a dorsal basal projection *J. laverna*
4. Discal line of both wings close to lower angle of cell ; anal tergite of ♂ broad, flat, with a high median crest, apex round *J. bethulia*
 Discal line of both wings farther away from cell, less prominent and less straight on forewing, antemedian lines more strongly curved ; anal tergite of ♂ longitudinally concave above, with the lateral margins turned up, recalling the spout of a jug *J. ecuadorensis*
 Dark antemedian and discal lines broad and straight (♀) *J. virgata*

